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No. XIII. OF VOL. II., 1935. LONDON, SATURDAY, SEPTEMBER 28, 1935 Pp. 120—Price 1s.
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ADDRESSES AND ORIGINAL ARTICLES

THE NEUROTROPIC VIRUS DISEASES*

BY E. WESTON HURST, M.D., D.Sc. Birm., M.R.C.P. Lond.

MEMBER OF THE RESEARCH STAFF, LISTER INSTITUTE, LONDON; READER IN EXPERIMENTAL PATHOLOGY IN THE UNIVERSITY OF LONDON

I

THOUGH Pasteur in his work on rabies discovered the first perfectly typical neurotropic virus as long ago as 1884, and poliomyelitis was shown to be due to a neurotropic virus in 1909, it is of recent years that our knowledge of the subject under consideration has grown by leaps and bounds; to-day neurotropic viruses are being found to play an ætiological rôle in an increasing number of nervous diseases. The world-wide epidemic of encephalitis lethargica at the end of the last European war was due almost certainly to the action of a virus; though conclusive experimental proof has never been forthcoming—possibly because the disease is transmissible to only one animal, man—all the indications point in this direction. Herpes zoster again is probably excited by a virus. Poliomyelitis is transmissible experimentally to only one group of animals other than man—viz., the monkeys and apes—and among these the New World monkeys are insusceptible; were this virus only a little more selective in its pathogenic activities, our knowledge of the causation of infantile paralysis would be exactly comparable with that of encephalitis lethargica and herpes zoster.

Of late many new neurotropic viruses affecting man and animals have been isolated, and it is quite clear that the discovery of others awaits only the application of the experimental method to cases of hitherto obscure nervous illness. For instance, in 1932 a research worker in New York was bitten slightly by an apparently healthy monkey. A vesicular lesion, accompanied by some lymphangitis, appeared at the site of trauma. Thirteen days later he developed an ascending myelitis, to which he succumbed on the 18th day; from the brain and cord a new neurotropic virus was obtained.[1] In 1933 an outbreak of encephalitis in St. Louis and Kansas City, Missouri, yielded yet another neurotropic virus.[2] In short, the subject of neurotropic viruses is to-day one of the actively advancing wavelets on the tide of medical science.

The Lesions and Their Distribution

Clinically, the activity of these viruses finds expression in symptoms of encephalitis or myelitis, according as the brunt of the attack is borne by a higher or lower level of the nervous system. In the great majority of cases, however, pathological examination reveals participation of all parts of the central nervous system, so that the term encephalomyelitis would seem a more appropriate one. For example, in poliomyelitis, in which commonly the chief symptoms are those of affection of the anterior-horn cells of the spinal cord, there are almost always to be found at autopsy slighter pathological changes in higher regions such as the brain-stem, basal ganglia, and motor cortex, as well as in the spinal ganglia and peripheral nerves. Recent observers suggest that such lesions may have an important influence on the symptomatology in the preparalytic stages of the disease, though later they are completely overshadowed by the destruction of lower motor neurons.

From the multiplicity of known neurotropic viruses it follows that encephalitis or encephalomyelitis is not one malady; in addition to the toxic and bacterial causes of brain and cord disease, there are many viruses capable of attacking the nervous system, and of producing a more or less characteristic clinical syndrome depending on whether they have largely a selective action on a particular region or are fairly diffuse in their activities. And these various forms of virus encephalomyelitis bear no closer relation one to another than does small-pox to measles.

The clinical features of the various maladies and the serious problem of therapy can be considered rationally only in the light of modern researches in pathology and pathogenesis. Our conception of the importance of the various histological phenomena has altered radically of recent years. We believe to-day that the perivascular infiltration and meningitis so prominent in human cases, in which examination must necessarily be deferred until a late stage of the disease, represent in many cases merely the reaction of these tissues to damage to the essential nervous structures. The great majority of neurotropic viruses directly attack and destroy the nerve-cells, whatever effect they may have on the vessels and meninges. In the earliest stages of many diseases in animals, the nerve-cells are already severely damaged before inflammatory signs make their appearance. In the later stages, inflammatory œdema and exudate may play a part in hindering the nutrition of the already affected neurons, and thus decrease their chances of recovery. But in contradiction to the classical accounts of, say, poliomyelitis, which picture the morbid process as beginning in the meninges and spreading thence along the vessels to attack the anterior-horn nerve-cells, I must stress the primary and severe involvement of the neurons. From the theoretical point of view we might expect this, for the viruses are eminently cytotropic organisms parasitising and growing in cells, and the very fact that some are strictly neurotropic indicates their lack of affinity for cells other than the neurons. From the practical standpoint recognition of this fact is fundamental, for nerve-cells do not multiply in extra-uterine life, and a cell once destroyed can never be replaced; the most that can be hoped is that other similar cells may assume its function.

The lesions due to neurotropic viruses are, then, more marked in the grey than the white matter of the brain and spinal cord. The nerve-cells undergo various kinds of degeneration. With viruses of low virulence the changes are probably not irreversible, and recovery of many of the neurons may follow. With viruses of extreme virulence the nerve-cells suffer acute necrosis, and are later engulfed and removed by phagocytic cells in the process of neuronophagia. If in such a case death does not result from involvement of the vital centres, or from secondary pneumonia or urinary sepsis, the patient is left with a loss which no drugs or mechanical treatment can do more than palliate. Coincidentally with, or immediately following the nerve-cell degeneration, inflammatory exudate appears in the tissues, perivascular sheaths and meninges, and may in subacute conditions attain such proportions that in the past it has been accepted as the primary lesion. A point worthy of emphasis is that these neurotropic viruses are not responsible for direct damage to the myelin sheaths; when nerve-cells are destroyed the usual myelin degeneration of Wallerian type ensues in the

* Abbreviated from the William Withering lectures in the University of Birmingham, 1935. Lect. II. will appear next week.

corresponding nerves and tracts, but a primary attack on the myelin is characteristic of quite another type of encephalitis to which reference will be made later.

Paths of Infection

Concerning the path by which these viruses reach the nerve-cells I shall have to confine my remarks to a few dogmatic statements. Poliomyelitis and rabies viruses are almost never found in either blood or cerebro-spinal fluid; the few positive results recorded have been obtained during the period of the declared disease, and hence are of no importance in indicating by which route the virus travelled during the incubation period. Other viruses, for instance that of pseudorabies, do occur in the blood, but it can be proved that they do not reach the nervous system by its agency.[3] On the other hand, it is known that poliomyelitis and rabies viruses do not reach the brain or cord if the nerves supplying the part inoculated are sectioned, showing that the virus travels by some anatomical component of the nerve trunk. After inoculation of poliomyelitis virus into the *left* sciatic nerve, virus and lesions first appear in the lumbar cord and next in the leg area of the *right* motor cortex.[4] Remembering that the pyramidal tract decussates in the medulla, it seems that the structure transmitting the virus in this case must be the nerve fibre itself. Further evidence has been furnished by transection of the cord and subsequent intracranial inoculation of virus, when virus and lesions are found only in that part of the cord above the point of section, though the segments below are still bathed with cerebro-spinal fluid and their blood-supply is intact.[5]

How then does the neurotropic virus reach the central nervous system in the case of natural infection? In rabies, of course, the virus is introduced by the bite of a rabid animal. In pseudorabies the virus probably enters in a similar way through a crack or abrasion in the skin or mucous membranes. In both cases the virus then infects the local nerve-endings and passes up the corresponding peripheral nerve to the cord. Probably, however, the usual route of entry of the neurotropic viruses is by the nose. The intranasal method of infection, by instilling drops of infective material into the nares of animals, is one attended experimentally by a considerable measure of success, even though it avoids all trauma which might be expected to facilitate the establishment of the virus. In the case of poliomyelitis it has proved possible by rather unusual experimental measures to infect monkeys by the gastro-intestinal route, but there is no proof that this is the route of invasion under natural circumstances. A few observers believe that the greater frequency of paralysis in the legs than in the arms or bulbar muscles is indicative of intestinal infection via the splanchnic nerves, but against this view must be set the observation that whatever the route of infection the legs are very frequently first and most affected. No, the evidence available is strongly in favour of an entry under natural conditions by the nose, and perhaps in cases of the bulbar form of the disease by the tonsils or nasopharynx. For a virus which has affinity only for nervous tissue, the nose constitutes a peculiarly convenient portal of entry. The terminal fibrils of the olfactory nerve are directly exposed on the surface of the olfactory mucosa, and after a short extracranial course pass through the cribriform plate to deliver the virus directly into the susceptible nervous system. The implications of these findings are far-reaching. If the results of animal experimentation can be applied to human pathology, poliomyelitis is from the first a primary disease of the nerve-cell, and there is no systemic or blood phase of infection during which liberal treatment of the patient with antiserum can prevent the virus from reaching the nervous system.

The foregoing account has not taken into consideration a small group of viruses which behave in quite a different manner and which I should mention for the sake of completeness. The only examples we know at present are the viruses of louping-ill, equine encephalomyelitis, and yellow fever. They are all transmitted by the bite of a blood-sucking insect and they all circulate in the blood; the nervous infection is intimately connected in a manner yet unexplained with their presence in the blood stream, and they do not ascend by the peripheral nerves. In the case of the unmodified yellow fever virus the neurotropic affinities are masked by the stronger viscerotropic action, but passage of the virus from brain to brain in mice is effective in revealing its neurotropic potentialities.

Clinical Differences between Virus Diseases

Now neurological symptoms and signs are determined in great part by the particular nervous structures involved, and by the tempo of the destructive process. Morbid processes of quite different nature may give rise to much the same symptoms. Localisation of a focal lesion depends solely on an accurate knowledge of anatomy, while diagnosis of the nature of the lesion is a much more difficult proposition. Since we have in so many cases a clinical syndrome characteristic of a particular virus disease, it follows that the symptomatology depends on one or two factors; either it is influenced by the portal of entry of the virus, and this must vary in the different infections, or the virus has a special predilection for certain areas of the brain or cord. It is possible to choose examples illustrating the operation of either of these factors. Intracerebral inoculation in the rabbit of the recently isolated B virus[1] leads to manifestations of encephalitis—hyperexcitability, convulsions, and speedy death. If, however, the virus is inoculated intramuscularly or intracutaneously, the invasion of the cord by way of the corresponding peripheral nerve sets up an ascending myelitis, which only after several days involves the vital centres of the medulla and thus in all respects copies the condition in man. Here the portal of entry of the virus is all-important in determining the symptomatology; presumably this virus has equal affinity for all parts of the central nervous system, and the clinical course depends on which level is first attacked. On the other hand, whatever their route of entry, certain viruses have a remarkably selective action on certain types of nerve-cell. Thus the main attack of poliomyelitis virus is on the anterior-horn cells of the spinal cord, that of louping-ill in the monkey on the Purkinje cells of the cerebellum, that of pseudorabies in the monkey on certain parts of the cortex near the temporal pole and the calloso-marginal fissure. The site of election of Negri bodies in the cornu Ammonis in rabies possibly represents higher resistance of a certain type of nerve-cell to the virus. It must not be concluded that in the cases quoted no damage occurs elsewhere; indeed I have already emphasised the diffuse distribution of the lesions due to almost all neurotropic viruses. But while in, shall we say, louping-ill, practically every Purkinje cell of the cerebellum is usually destroyed, in the cortex, basal ganglia, brain-stem, and cord only a small and variable proportion of neurons suffer the most severe changes, with the result that the symptoms are dominantly cerebellar. In contrast we may consider the protean symptoms of the acute stages of encephalitis lethargica to be due to the variable distribution of the most severe lesions, though even here certain symptoms recurred in a considerable percentage of cases.

We are now in a position to consider individually some of the commoner neurotropic virus diseases, and perhaps first of all poliomyelitis claims attention.

Poliomyelitis

Many practitioners still think of poliomyelitis as a disease characterised chiefly by a more or less extensive, flaccid paralysis of sudden onset, often persisting as a permanent disability. But this is not the complete picture of the malady as we know it to-day. Poliomyelitis is a disease probably affecting a very large proportion of the community—at least of the urban community; it is only occasional cases, estimated by some at less than 1 per cent. of the total infected, which develop paralysis and are diagnosed as such. Where investigations have been made it has commonly been found that 50–80 per cent. of the adolescent and adult population carry neutralising antibodies in the serum, and with very few dissentients bacteriologists believe that this is certain evidence of previous infection. If this view is correct, we must assume that in these cases symptoms of infection have been so indefinite that, if attracting attention at all, they have been attributed to a slight chill or other minor ailment and their significance missed. We might be less inclined to believe this were there not cases of intermediate severity, the so-called abortive cases, in which symptoms, while sufficiently definite to attract attention, do not progress to paralysis.

In America, diagnosis of these abortive cases is becoming increasingly frequent on the basis of a suspicious symptomatology confirmed by cerebro-spinal fluid examination. In this country, unfortunately, diagnosis is commonly not made until the child has been paralysed for 24–48 hours. This is partly due, of course, to the greater relative frequency of sporadic cases, but it is also in part attributable to the fact that the general practitioner has not been taught to recognise the initial symptoms as those of poliomyelitis. In the period when the disease was believed to be due to a systemic infection only later localising in the nervous system, the tendency was to dismiss the early symtoms as those common to all febrile disturbances. Now that it appears highly probable that from the first entry of virus by the nose poliomyelitis is a nerve-cell disease, observers are realising that the initial symptoms must be indicative of the march of the virus from nucleus to nucleus on its way to the cord.[6]

In the *first phase* of poliomyelitis it is not so much the individual symptoms that count as the general impression received by an experienced observer. As an American authority says:—

> ". . . there seems to be little doubt in the minds of those who have seen much of the earliest hours of the disease that a very definite and characteristic clinical picture presents itself. But it is difficult by descriptive method to transfer an adequate impression of the subtle and striking difference between the onset hours of infantile paralysis and those of any other of the acute infectious diseases of childhood. To say that the temperature is elevated, often as high as 103° or 104°, and that the child is flushed and miserable; that vomiting often occurs and that drowsiness supervenes, does not offer sufficiently distinguishing evidence of the special type of infection. Nevertheless, this common symptom complex is shot through with delicate manifestations that are unmistakably specific, but which must still be viewed as clinical impressions—those helpful though indefinite aids in diagnosis.
>
> "Now when infantile paralysis becomes epidemic in a locality which has been previously free from its presence, the physicians in that territory soon appreciate this difference from the usual illnesses of children—there is a look of mingled apprehension and resentfulness quite unlike the alert, bright, and shining eye of other fevers. The psychic change responsible for this look finds further expression in a characteristically annoyed shrugging of the shoulder which occurs when the child is touched or simply spoken to. Indeed, there is frequently a snarling whine of resentment which is synchronous with this gesture of discontent. . . . (In) cases of overwhelming infection . . . there are other striking phenomena. The child is restless, breathes rapidly, and seems to be busily and actively resisting some incomprehensible disturbance of its usual comfort. In these instances, the irritability and resentful manner are not marked, but the whole organism seems to be composed of tensely drawn wires—a universal overstimulation. This pressor state of the nervous system is so marked that a sort of impulsive ataxic tremor is present in every motion, especially when that motion has intent. . . . Usually a few cases are met with whose profound stupor masks all other signs and symptoms. . . ."

Among the manifestations of specific nature here mentioned we may note especially (1) disturbance of sleep rhythm—sleepiness by day and restlessness by night as occurs in a more pronounced degree in some cases of encephalitis lethargica; (2) general hyperæsthesia to every touch and passive motion whatever their situation; (3) disturbances of the vegetative system—sweating, flushing, disturbed intestinal peristalsis, tachycardia, and so on. It has been suggested[6] that almost all of the symptoms at this stage can be referred to lesions in the thalamus and hypothalamic region, and we know that after intranasal inoculation in the monkey these are among the first centres infected from the olfactory bulbs.

In the *second phase* of the disease, still in the absence of paralysis, the foregoing symptoms continue, but new symptoms and signs are now more prominent. These are localised pains and tenderness (rather than general hyperæsthesia), stiff neck, painfulness of the neck and spine to flexion. Ataxia, tremor, and early weakness follow. According to the older theory of pathogenesis, these are signs of meningeal irritation announcing the extension of the systemic infections to the meninges. To-day, knowing that there is no systemic infection and that meningitis is not a feature at this stage of the disease, but that there are lesions in the spinal ganglia and posterior horns of the spinal cord, we accept these symptoms as evidence of the further march of the virus from higher regions to lower, probably largely through the spino-thalamic tract.[6]

The *third phase* of poliomyelitis, that of flaccid paralysis, represents the final onslaught of the virus on the motor cells of the anterior horn, which for some unknown reason are peculiarly susceptible to its action. To diagnose poliomyelitis at this stage is equivalent to shutting the horse's tail in the closing stable door.

The rate at which the disease progresses from one point to another is subject to considerable variation.[6] In some cases it is more than a week from the appearance of the first symptoms before paralysis occurs. In the abortive cases (diagnosed by positive findings in the cerebro-spinal fluid) paralysis never occurs, though there is little difference between the initial symptoms in this group and in that which later becomes paralysed. In many cases there are intervals of interrupted progress—in fact there is in man a conspicuous tendency for the disease to come to a stop temporarily or permanently anywhere in its course. On the other hand, many cases progress very rapidly. Nevertheless, it is rare to find a case in which characteristic alterations of the spinal fluid cannot be detected before the appearance of paralysis, and early diagnosis can almost always be made provided that the clinician's

knowledge of the early symptoms suggest to him the simple operation of lumbar puncture.

In the text-books are described various forms of poliomyelitis, the bulbar, the cerebral, the cerebellar, &c. The returns of the Registrar-General each year report a certain number of cases, constituting possibly 20 per cent. of the total, and designated polio-encephalitis. What they all are is very difficult to find out. Some, no doubt, are bulbar cases of poliomyelitis, that is, cases in which the motor nuclei of the brain-stem happen to be more affected than those of the cervical and lumbar cord; to label them polio-encephalitis may be technically correct, but is nevertheless confusing as there is no essential difference between them and the usual forms. Levels of the central nervous system above the brain-stem are probably never involved more severely than is necessary to produce the symptoms of the preparalytic stage, and the so-called cerebral and cerebellar forms of the disease are almost certainly due to some other cause; it has never been shown that the virus of poliomyelitis can evoke such syndromes in either man or monkey.

Landry's Paralysis

Another syndrome to which I must now briefly refer is that passing under the name of Landry's paralysis. By definition this is an acute ascending flaccid paralysis with minimal sensory and sphincter disturbance. Most of the cases prove fatal from involvement of the medullary centres. Cases which recover are said to do so completely. Fatal cases show no definite changes in the nervous system, which fact perhaps links the condition to the more severe types of acute toxic neuritis.

Now an identical symptomatology may obtain in at least two neurotropic virus diseases, though sections show in these cases definite and characteristic lesions in the spinal cord. One such disease is poliomyelitis—the more severe cases with weakness beginning in the legs and rapidly ascending to the medulla fulfil all the clinical requirements of Landry's description. The second condition is rabies. In the usual form of this malady the symptoms until a late stage are those of overstimulation rather than of paralysis of the nerve centres. But sometimes in man, and constantly in certain species of animals, paralysis predominates from the start. In most parts of the world human ascending flaccid paralysis due to rabies is far from frequent; in an outbreak in Trinidad, however, in the years 1929–31, all the cases were of this type, and the nature of the infection was never suspected until animal inoculation revealed, not the virus of poliomyelitis which had been under suspicion, but that of rabies.[7] Even then it was not clear whence originated the infection, for the island has as strict a quarantine as does this country, and rabies in dogs is unknown; finally some evidence was accumulated to incriminate the vampire bat, biting the toes of natives sleeping in the open, as the transmitter of the virus.

It seems, therefore, that we can either accept the original and text-book specification of Landry's paralysis, with the proviso that we cannot possibly be sure of the diagnosis until we have histological preparations of the spinal cord, or we must admit that Landry's paralysis is no more than a clinical syndrome common to a number of very different conditions.

Herpes Zoster

We have seen that poliomyelitis virus has an especial affinity for the lower motor neuron, and we may now devote a moment to herpes zoster which attacks the lower sensory neuron. We believe zoster to be a virus disease both on general and epidemiological grounds, and because inclusion bodies have been found in the vesicular skin lesions. We have, however, no final proof of this, partly because zoster is not a fatal disease but chiefly because we have no experimental animal in which to test our theories. Up to the present, transmission with fluid from the vesicles has succeeded only in children who have not suffered previously from zoster or varicella; such children develop either a localised vesicular lesion or occasionally a generalised eruption indistinguishable from that of varicella. In zoster the most marked changes are usually in the spinal ganglia corresponding to the level and side of the eruption, or on occasion in the Gasserian or geniculate ganglia in the case of the rarer distribution of the eruption, but the corresponding nerves and nerve-roots are involved, as are also the posterior horns of the spinal cord. Very rarely the anterior horns are affected and paralysis ensues. There are two groups of cases, that in which no known predisposing cause operates, and that in which the eruption is precipitated by some other pathological condition of the ganglion—syphilitic inflammation, carcinomatous infiltration, trauma, arsenical medication, and so on. Since specific complement-fixation tests are obtained in both groups, if the former is ultimately proved to be due to a virus, we shall have to conclude that the latter is caused by the same virus latent in the patient until activated by the predisposing morbid condition.

Most interesting, however, is the apparent relation of zoster to chicken-pox. Quite often the latter has been reported as occurring, within the usual period of incubation, in a recent contact with a case of zoster, and much less often the reverse has been noted. Zoster and a generalised eruption like that of varicella may occur together in the same patient. With the complement-fixation test cross-immunity between the two infections can be demonstrated.[8] Finally it has proved possible to isolate from the vesicular fluid in zoster and varicella elementary bodies similar to those in vaccinia and small-pox. Pure suspensions of the bodies of either origin are specifically agglutinated by both zoster and varicella convalescent sera.[9] It is clear that the relation between the two infections, suspected now for many years, is a close one.

Encephalitis Lethargica

The next disease demanding consideration is encephalitis lethargica. It first appeared in Europe about 1917, and soon spread to almost all countries. In Japan it occurred together with an entirely different virus encephalitis, which had been recognised previously and has outlasted encephalitis lethargica; the two are there known as the Type A and Type B encephalitis respectively. Many workers were attracted to this new field of investigation, and then the acute disease virtually disappeared.

Again, on general grounds we believe this to be a neurotropic virus infection, but again final proof is not forthcoming. Various claims have been made that the virus has been discovered, but in most instances the organisms isolated appear to have been strains of the virus of herpes febrilis. Since this virus has been obtained from the cerebro-spinal fluid of a case of neurosyphilis, and other evidence speaks against its ætiological rôle in this connexion, only a mere handful of observers believe that it is the cause of encephalitis lethargica. Inclusions of the type usually associated with virus infections have been described but rarely, and on these occasions the diagnosis has not been beyond doubt. Our present interest in the condition is thus largely clinical.

Encephalitis lethargica began as a hyperacute malady characterised by headache, vertigo, delirium,

and convulsions. The average onset then became more gradual, and lethargy occupied a prominent place in the symptomatology. Coma occurred in the terminal stages. Often restlessness at night alternated with sleepiness by day—a symptom which we have already seen obtaining in slighter degree in the pre-paralytic stages of poliomyelitis. Occasionally the reverse disturbance of sleep, insomnia, prevailed. Ophthalmoplegias due to damage to the ocular nuclei of the mid-brain were an almost constant feature. Choreiform movements, myoclonic muscular contractions, a parkinsonian facies, and catatonia also occurred in some of the earlier acute cases. Roughly one-third died, one-third recovered, and one-third passed into the chronic stage; in the last group both mild and severe initial cases were represented.

In the chronic disease many of the major features of the acute attack are represented in a modified form.

Extrapyramidal disturbances of motility find their expression in the condition of parkinsonism, probably resulting from injury to the substantia nigra.

Mental symptoms indicating involvement of the highest levels of the central nervous system were in mild cases confined to protracted nervousness, undue lassitude, anxiety, depression, and inability to concentrate. Often, however, especially in children, they were more severe, and constituting a complete reversal of the patient's previous mentality and morality led him into abnormal behaviour which in many cases necessitated institutional treatment.

In the earlier days of the epidemic disorders of sleep often persisted after the acute stages. Lethargy, insomnia, and reversal of sleep rhythm need no further mention. Narcolepsy was an occasional sequel; it also occurs, of course, as an independent disease. In this condition the patient feels an uncontrollable desire for sleep which must be gratified however inconvenient the time or place, and he lapses into slumber during the course of conversation, and passes his destination in tram or bus. The attacks may recur several times daily or only at infrequent intervals, and last usually only a short time; they often come on in circumstances normally conducive to sleep, as after lunch on a warm day.

Possibly allied to these disorders of sleep are peculiar periodic attacks usually involving the musculature of the eyes and jaws, upper trunk and limbs, or the respiratory mechanism. Among the most interesting are the oculogyric crises. The patient may state that with or without warning the eyes "shoot up into the head." As a rule the movement is upwards, but it may be in other directions. The eyes become fixed and cannot be brought back. This may take place twice or thrice a day or only once in several weeks, and may last a few minutes or several hours, during which time the patient is helpless. Not infrequently an attack ends in sleep, and sleep always ends an attack. It may be started by emotional excitement, but sometimes also be inhibited by will or by some external, mental or physical stimulus. Retraction or deviation of the head, restlessness, dizziness, flushing of the face, diplopia, opening of the mouth, all may accompany the attack; sometimes the crises are accompanied by curious psychological phenomena in the nature of compulsive ideas. There is evidence that in this condition the eye muscles are not in spasm as one might think, but at rest; in other words the eyes are in the position to which normally they wander during sleep—a position which varies in different individuals and perhaps in the same individual at different times. In short it seems that the ocular muscles have gone to sleep while the remaining phenomena of sleep are absent. Similarly attacks of lid-closing may represent a dissociation of the phenomena of normal sleep.

Disorders of respiratory rate, usually in the direction of an increase, may be paroxysmal or continuous. Alterations of respiratory rhythm, or breath-holding spells accompanied by choreo-athetoid movements of the limbs and bizarre attitudes, or respiratory tics including yawning, sniffing, spasmodic cough and spitting are also encountered.

Some Other Neurotropic Virus Infections

Of the other neurotropic virus infections, the Australian X disease, though largely a disease of childhood and adolescence, differs from poliomyelitis in that the symptoms are mainly cerebral in nature; paralyses are rare and not persistent. From encephalitis lethargica the diagnosis is made by the infrequency of cranial nerve palsies and the usual complete recovery. The virus, moreover, is definitely pathogenic for monkeys, sheep, and other animals. The fact that some sheep are refractory to infection suggests possibly that this is a disease also, or even primarily, of domestic animals.

The B virus has been responsible for two cases of ascending myelitis, one in a research worker who was bitten by an apparently healthy monkey, the other in a laboratory attendant accustomed to handle these animals. For this reason, and because normal monkeys may show a high titre of neutralising antibodies to this virus in their serum,[1] it appears that the disease is one frequently occurring in the monkey; experimental work shows that the monkey infected in the skin with the virus does not acquire a fatal myelitis but may survive immune. On the other hand, in the rabbit a disease develops exactly similar to that in man, and invariably proceeds to a fatal termination.

Another animal disease potentially capable of affecting man is louping-ill. This malady of sheep is endemic in some areas of Scotland; since the virus was first isolated in 1928 no fewer than four laboratory workers have developed symptoms varying from a mild attack of what was called influenza to a definite encephalitis with headache, vomiting, delirium, tremor, and lethargy, with subsequently neutralising antibodies to the virus in the blood.[10] The possibility of the disease occurring in farm hands in the infected areas should be considered.

The St. Louis outbreak of encephalitis [2] occurred in that town and Kansas City during July to October, 1933, and affected more than a thousand people. In many respects its chief features were those of the Japanese type B encephalitis. For example, it occurred in elderly rather than young subjects, and although the total mortality was in the neighbourhood of 20 per cent., only 5 per cent. of patients under the age of forty succumbed. However, the identity of the two has since been denied. Although certain workers hailed the outbreak as one of encephalitis lethargica, it differed in that a virus pathogenic for mice and monkeys was isolated without difficulty. Mental confusion, aphasia, tremor of the hands, tongue, and lips, and drowsiness seem to have been the commonest symptoms, though vertigo, ataxia of the arms and legs, facial paralysis, and spastic weakness of the limbs are also recorded. Ocular symptoms were rare. Recovery was rapid and complete.

It is perhaps difficult for us to interest ourselves greatly in outbreaks of encephalitis in Japan, Australia, and the Middle West of America; these countries are so remote and there are so many pressing problems nearer to hand. But I feel that we should at least bear them in mind. Not only may their study throw light on what has hitherto been obscure in more familiar infections, but to-morrow may see them epidemic in our own population. Year by year transport becomes more and more rapid, and more and more people travel widely. When the present economic depression is over this tendency will be even more apparent than to-day. Another war may bring into direct contact peoples from opposite ends of the earth. It is within the

bounds of possibility that there may result world-wide epidemics of diseases previously confined to one locality, and among these we must not ignore the various types of encephalomyeltis.

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THE FORCEPS OPERATION

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IN an attempt to lessen mortality, damage, and illness resulting from the abuse of the forceps operation obstetric leaders have for many years advocated the decreased use of the instrument. The fact that this advice has required such repetition shows that for the most part the seed has fallen upon stony ground. In those hospitals which are in charge of the expert obstetricians, some control can be and is directed to the incidence of the forceps deliveries. Such institutions indeed take pride in an ever-decreasing forceps rate. But obstetric practice outside hospitals presents altogether another problem. A forceps delivery may be forced upon the doctor in charge by pressure from the patient or her relatives; he may have been engaged to conduct labour with the express purpose of ensuring its expedition; he may himself be pressed for time and quite unable to spend several hours watching the fœtus appear and disappear; or his efforts may be directed solely towards relieving the patient of what he considers to be unnecessary suffering. In addition to these possible factors, the control of a patient in her own home is a very different matter from her control as an inmate of a large hospital. For all these reasons I contend that advice directed against the use of the forceps is unlikely to be acceptable because it is not really practical.

The following figures were obtained from one of the leading maternity homes in London and the patients, for the most part, were under the care of obstetric specialists who are teachers of this subject. Delivery was completed by the forceps operation in 203 of the last consecutive 300 cases (primiparæ). The maternal morbidity was low, under 2 per cent., the maternal mortality nil, and the infant mortality under 3 per cent. In the great majority of cases the fœtal head was resting on the pelvic floor. It is thus likely to be more profitable to find some way of reducing the risks associated with the application of forceps than to attempt to stop their use. I hope to show that the substitution of a short light forceps for the axis-traction design will meet the needs of the doctor and will enable him to shorten labour without danger to mother or child. In order to appreciate the reasons why the axis-traction forceps should be superseded by a more suitable instrument for the delivery of a head low in the pelvis it is necessary to recall briefly the history and evolution of the obstetric forceps.

About the beginning of the seventeenth century the prototype of the obstetric forceps was devised by the Chamberlen family. It is sufficient to note that for the first 150 years of its existence the instrument was of the short straight variety. The lock was then added, as also was a short shank, whereby the radius of the cephalic curve was lessened and the blade more closely fitted the fœtal skull. In the middle of the eighteenth century Levret and Smellie independently altered the existing type by lengthening of the shank and adding the pelvic curve. After another century Tarnier introduced the principle of axis traction.

During the last eighty years there has been no change and the modern instrument used in practice and in the teaching schools is the long curved forceps with some axis-traction modification.

This evolution of the obstetric forceps was consequent upon the use to which the instrument was put. Primarily the forceps was used to aid delivery of the fœtal head; for obvious reasons the instrument could only be applied to a head low in the pelvis. In the attempt to adapt the instrument to assist the delivery of a fœtal head obstructed in the mid-pelvis the forceps was lengthened. The tractive power was greatly increased by the addition of the English lock by Smellie. The blades were applied more correctly to the fœtal skull and the attitude of flexion was less disturbed by the addition of the pelvic curve. The final refinement was the application of the various axis-traction modifications. These are ingenious and for the main part mechanically sound. With their aid an immensely greater tractive effort may be exerted.

Disadvantages of the Axis-traction Forceps

There is to-day little need for the continued use of this bulky, powerful, and ingenious instrument. The conditions that may necessitate a forcible extraction of the fœtus are cases of disproportion between the pelvis and the fœtal head as a result of contraction of the former or malposition of the latter. Occasionally the delivery of the fœtal head from the mid-pelvis may be considered advisable owing to the appearance of signs thought to be indicative of fœtal distress. It is my considered opinion that in such cases a forcible and rapid delivery often prejudices the survival of the baby.

Before the late war preventive medicine began to establish a hold on obstetrics, and from 1919 onwards what we know as antenatal supervision has developed rapidly. One of the aims of antenatal work is to discover those cases in which obstruction may occur in labour because of a misfit between the head of the child and the pelvis of the mother. It is not necessary here to discuss the many methods used to deal with the problem of dystocia, or to criticise the success or failure thereof. One result, however, is apparent. Whenever any serious attempt at antenatal supervision has been made the major degrees of disproportion have been foreseen. The detection of the abnormally small pelvis or large baby is not now left until a condition of obstruction has developed after some hours in the second stage of labour, but the presence of disproportion is discovered during the pregnancy. The fœtal head that is not engaged in the pelvis in the latter weeks of pregnancy is regarded with grave suspicion and every effort is made to detect a possible misfit. In consequence, even in the obstetric hospitals to which such emergencies are sent, it is unusual to see

cases in which completion of the labour necessitates destruction of the child or the high forceps operation. Should a case of this nature occur it almost invariably is found that the patient has had no antenatal examination.

It has been pointed out above that the long curved forceps as used to-day was conceived, designed, and constructed to deal with the case of the woman whose pregnancy had had no supervision and in whom obstructed labour had occurred, the fœtal head having failed to descend in the pelvis. There is abundant proof, clinical and statistical, that to-day the high forceps operation for minor disproportion is seen but rarely, and, in theory, it should never be required when the patient has had adequate antenatal care. Delay in labour may occur with the head in the mid-pelvis or at the pelvic brim as a result of incomplete rotation or flexion or because of the posterior position of the occiput. Miller and Stacey, in an analysis of the causes of the "failed forceps" operation, showed that the occipito-posterior position is a most important cause for the failure to complete delivery.

When delay in labour occurs and the fœtal head is anywhere but on the pelvic floor there is no call for the use of an instrument lengthy enough to reach and grasp it. Such delay indicates, rather, the anæsthetisation of the patient and a thorough examination to ascertain the cause. Too often this is not done. The forceps are applied, a silent appeal is sent out to the goddess of luck, and a good deal of force exerted. This usually results in the "failed forceps" case to which reference is made below.

Certainly in theory, and almost as certainly in practice, there is to-day far less indication for the high forceps operation and therefore for the use of the long curved instrument.

That the use of the long curved forceps is fraught with potential dangers to mother and child is well known, so much so that most writers of text-books consider it necessary to devote a special section to the dangers of the forceps delivery. The student is warned that the lower segment and the cervix may be torn if the head of the child is forcibly pulled through an insufficiently dilated cervix, that the vagina and vulva may be injured, and that the bladder even may be torn. Post-partum hæmorrhage may follow too rapid delivery, and uterine sepsis is more likely to supervene in such cases. The skull of the child may be fractured or its scalp torn, the face of the child may be paralysed or its eye may be injured; meningeal or cerebral hæmorrhage in the child may occur.

This frightful list is no exaggeration. It has, in fact, been reproduced from a well-known standard text-book; and most of the calamities prophesied may in fact be encountered by one with only a small experience of obstetrics. But the whole story of the dangers attendant on the use of the forceps has by no means been told, notably the great danger to the mother of the so-called failed forceps case. Such cases occur so frequently and are accompanied by so extensive a maternal mortality and morbidity as to cause grave concern, and the subject comes up for discussion regularly at meetings of the obstetric societies throughout the country.

It has been shown repeatedly that failure to complete the delivery with the forceps often is not due to a mechanical obstruction. In only a minority of cases is "delay" in labour due to the fact that the baby's head is too big for the pelvis; thus, lack of adequate antenatal supervision is not responsible in any way for the failure.

Stacey,[1] in a review of 154 of such cases, found that in no fewer than 100, or 66 per cent., the forceps were applied when the cervix was not adequately dilated to deliver the child. In 47 of these cases there was no possible cause, other than the incompletely dilated cervix, to account for the failure to deliver. In 3 per cent. only of the series was failure to complete the delivery due to disproportion. Miller,[2] in a study of 558 cases, has demonstrated precisely the same causes for the failure. In this series the application of the instrument while the woman was in the first stage of labour, or prematurely to a head in the occipito-posterior position, accounted for 3 out of every 4 cases where failure to deliver had occurred. There was a maternal mortality of 10 per cent. in Miller's series of cases. Stacey gives a most comprehensive review of the end-results of this disastrous complication. The maternal mortality was 14 per cent. and the maternal morbidity (B.M.A. standard) 25 per cent. Only 48 per cent. of the infants survived. A follow up of the patients who recovered showed that over half the women suffered from damage to the perineum, vagina, or cervix, which in a few amounted to the grossest examples of trauma involving the lower uterine segment, bladder, or rectum, and resulting in vesico-vaginal and recto-vaginal fistulæ.

I have directed attention to failure to deliver after the application of the forceps because its consequences are so serious. The authors of text-books have, almost without exception, omitted to insert sufficiently grave warnings on this subject, other than that the instrument should not be applied unless the cervix is fully dilated and taken up. The increased risk to the child in the high or medium forceps operation requires no emphasis. In many of these cases the instrument is applied to a fœtal head not fully flexed or to one lying transversely, obliquely, or with the occiput posterior in the pelvis. Crawford's [3] remark that the same doctor who handles a new-born infant with the gentlest care thinks nothing of applying powerful compression to the fœtal head is worthy of serious consideration.

No further emphasis need be laid on the danger both to mother and child that may attend the use of the long curved forceps with axis-traction modification. To-day there should but rarely be the necessity to resort to any but the low forceps operation, which consists in the lifting of the fœtal head past the perineum. The question may next be asked why it is that throughout the country the medical student continues to be taught the use of a heavy and powerful instrument so constructed that (1) it can be applied to an undescended fœtal head, (2) it can be used when the os is not fully dilated, when its misuse is attended by the risk of grave danger to both mother and child, and when the circumstances for which it was designed no longer exist in theory and are but rarely seen in practice? The misuse of this instrument is variously described as being the result of ignorance or apathy on the part of the practitioners, or the deficient teaching of practical obstetrics to the medical student. Thus the Scottish Departmental Committee in their interim report state [4] that: "in nearly one-third of the cases classed as errors of judgment on the part of the doctor, the mistake was premature application of the forceps."

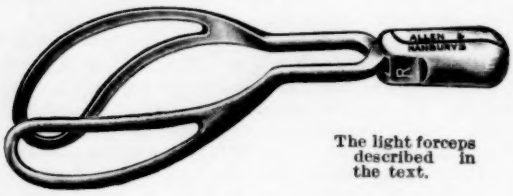
REASONS FOR ITS CONTINUED POPULARITY

The explanation for the continued popularity of the long curved forceps is probably to be found in the combination of a number of circumstances. First, the instrument has the weight of tradition behind it, and though it has its dangers, is used and has been used times without number to put an end to pain and suffering. Secondly, it is only in a small percentage of cases that its use is accompanied by damage to the mother and child. Thirdly, in the teaching schools its use is to some extent regulated and restricted. Teachers have largely themselves to

blame for the students' lack of appreciation of the potential dangers of the mid- or high-forceps operation. This operation is almost universally relegated to the house-officer, or at the best the obstetric registrar may be asked to give his aid. It is unconvincing, to say the least of it, to thunder or bewail at the probable dangers attendant upon a certain procedure when its execution consistently is left in the hands of a junior. The solution of the difficulty does not lie in the making of rules which shall regulate the circumstances under which the forceps may be used. Such rules have been formulated, repeated and emphasised. They are for the most part unavailing and Miller [2] sums up the situation very well in saying that "to insist that the forceps should not be applied unless on strict obstetrical indications may be a council of perfection." The solution is that the medical student should never see the long curved instrument used for routine forceps delivery. The appearance of this instrument should be respected and whenever possible accompanied by a visit of the obstetric physician to the labour ward.

A Short Light Forceps for Delivery of the Low Fœtal Head

What is needed nowadays is an instrument that can complete the delivery of a fœtal head that is low in the pelvis. This instrument should be designed for the purpose and its design should be such that it cannot be applied to the head that is high in the pelvis or through an undilated os, and that its application cannot be followed by the employment of tremendous tractive efforts. Two hundred years ago William Smellie [5] wrote "to free myself from the temptation of using too great force, I have always



The light forceps described in the text.

used and recommended the forceps so short in the handles that they cannot be used with such violence as will endanger the woman's life." Miles Phillips [6] comments on this teaching and writes: "I tell my students that the long curved forceps might well be kept at the Town Hall, and be only available on a magistrate's order." This is an excellent suggestion in more ways than one for by the time the innumerable application forms had been duly filled in, signed and countersigned, and the instrument procured, the baby would mostly have been born.

In William Smellie's day there was no antenatal supervision and in consequence it must be supposed there was a correspondingly greater number of cases in which the use of the long curved forceps was indicated. Yet even he advocates an instrument with short handles which cannot be used with great force. The universal adoption, especially in the teaching schools, of a short light forceps is greatly to be desired. Some few years ago I discarded the long curved instrument and began to use Simpson's short straight forceps. The instrument had the disadvantage that an incorrect application to the fœtal head was probable. The tips of the blades were apt to grip, bruise, and mark the skin of the baby's head over the supra-orbital ridges. The usual pelvic curve was therefore added to the blades. The instrument I now use (see Figure) weighs less than 10 oz., that is to say, it is about one-quarter the weight of its heavier predecessor. The lightness of the instrument gives the accoucheur an added sense of confidence in that he can appreciate exactly the passage of each blade during its application.

A SERIES OF DELIVERIES BY LIGHT FORCEPS

An analysis of the last 58 consecutive deliveries of primiparous women in my practice shows the following figures.

In all these 58 cases the fœtus presented by the vertex and when the forceps were applied the light instrument only was used. In 23 women delivery was unaided. In 32 women the head was lifted through the pelvic floor with the forceps. In 3 cases manual rotation of a fœtal head in the persistent occipito-posterior position was required. The fœtus was delivered easily with the light forceps in 2 of these women. The fœtal head did not sink down into the pelvic cavity after rotation in the remaining case and the long forceps were applied.

From this series it may be argued that it was unnecessary to lift the fœtal head through the pelvic floor in the 32 cases in which this was done, and that these women, if they had been left alone, would have delivered themselves successfully. Probably this would have occurred eventually. But the duty of the attendant is to alleviate pain in so far as it is possible to do so without prejudicing the life or well-being of the mother or child. That has been a legitimate excuse for numberless forceps deliveries in the past. I hold the view that, with efficient ante-natal supervision, by far the most important cause of delay in labour occurs when the fœtal head reaches the pelvic floor and that the very low forceps operation required to effect delivery at this stage is unaccompanied by harm to the mother or child. In the series of cases cited above all the babies were delivered alive and well, with one exception in which there was no bone formation in the vault of the fœtal skull. There was no maternal morbidity. It is interesting to note that the incidence of laceration of the perineum was slightly less in those women whose delivery had been assisted by the forceps.

ITS ADVANTAGES

Anyone who has used the light instrument would expect this. The blades are so slight and apply themselves so accurately to the fœtal head that for practical purposes they do not provide any added bulk to distend the vaginal outlet. In this respect Munro Kerr [7] writes: "as a matter of fact there is less bruising and injury with judicious employment of forceps than if the head is permitted to press unduly long upon the perineum." The accurate apposition of the instrument to the fœtal skull allows both forward and backward movement to be controlled by the handle. Thus one of the attendant's hands controls, and controls efficiently, the fœtal head and the other can be used to try to preserve the perineum. To control the spontaneous delivery of a fœtal head three hands really are required; one to prevent too rapid progress, one to prevent the head receding during the interval between contractions, and a third to control the perineum. The light forceps combines the action of the hands which prevent too rapid progress and the receding of the head. That laceration of the perineum occurred less frequently in the forceps cases in this series speaks for itself. For in a certain number of these women the actual delay was thought to be due, not to uterine inertia, but to the smallness of the vaginal outlet. This could not

apply to such an extent in women who were delivered spontaneously. The instrument has other added advantages. Its construction is such that it is impossible to exert a tremendous pull, and the risk to the child should in consequence be enormously decreased. The instrument cannot be applied to a fœtal head that is not well down in the pelvis and therefore only rarely before completion of the first stage of labour. It can be applied and has been applied without an anæsthetic when the woman required help in the last stages and the appreciation of the pains was sufficiently dulled by the previous administration of analgesic drugs. In any case, only the lightest anæsthetic is required for its application. The small size of the instrument moreover greatly facilitates the ease with which it is sterilised.

Conclusion

Taking into consideration the facts outlined above and with the firm belief that the really low forceps operation is virtually without risk to the mother or child, I hold that it would be better to advocate a more liberal use of the short light forceps at the end of labour than, turning a blind eye to what is obviously a universal practice, to teach the strictly limited use of another instrument which is far too clumsy and heavy for this purpose.

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THE VALUE OF BREATHING EXERCISES IN ASTHMA

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THE remedial value of breathing exercises in asthma has been known for many years and has been practised by the medical profession in this country and abroad. On the continent Dr. L. Hofbauer, of Vienna, claims excellent results from humming exercises in his book on the treatment of asthma.[1] In this country breathing exercises have been used as an adjuvant to other forms of treatment in various physiotherapeutic departments, including those of Guy's, the Hospital for Sick Children, Great Ormond-street, and King's College Hospital.

Outside the medical profession breathing exercises have been more widely used. Asthma is rare in singers and teachers of singing have advocated this discipline as a cure. In Hamburg, Albrecht Thausing, Ph.D., has claimed good results from laryngeal exercises.[2,3] In Berlin, Fräulein von Ruchteschell teaches expiratory exercises with success.[4] In London, Miss Ella Seyfang has treated asthmatics successfully by means of breathing and other exercises for many years.

It was suggested that the value of breathing exercises should be investigated in the asthma clinic at King's College Hospital, and Miss Seyfang agreed to treat asthmatics in the clinic by this means. Her results suggested that research, in properly controlled cases, might show the type of patient likely to benefit from this form of therapy. After arrangements for carrying out this research had been made, Miss Seyfang unfortunately found herself unable to continue her work at King's College Hospital and resigned in December, 1932.

As the universally recognised aim of respiratory exercises in asthma is the education of the patient in the proper control of the diaphragm, together with mobilisation of the chest wall, a series of exercises was drawn up by Dr. E. B. Clayton and his assistants in the physiotherapeutic department with these objects in view. They are well-recognised, simple exercises and have been practised by the patients forming the subject of this investigation. Those used by Miss Seyfang differed only in detail.

The cases under consideration have been closely observed for a period of from one to two years and the clinical condition of each has been assessed twelve months after the beginning of treatment, thus allowing for seasonal variations in the severity and frequency of attacks. We are aware that one year is too short a time in which to judge the permanence of results, but we hope to follow up these and other cases and make a further report at a later date.

The aim of this investigation was to observe the results of treatment by breathing exercises alone. For proper scientific control frequent observation of the cases over a period of at least two years would have been necessary and every other form of treatment, including drugs, should have been prohibited; in the asthmatic even a placebo of brown sugar in water might have a psychological effect. In practice we found it impossible to enforce such rigid control, as the mentality of the hospital type of patient requires something concrete—the bottle of medicine or pill—as an incentive to regular attendance. Again all the patients without exception had been taking various remedies obtained from their family doctor or from the chemist, the type and dose of which we could not control. We decided that the only practical course was to prescribe certain simple drugs ourselves and to forbid all other treatment. The drugs were gradually withdrawn as the patients gained confidence in the exercises, commonly in 4–8 weeks.

THE AIMS OF BREATHING EXERCISES

During an attack, in which the bronchioles are narrowed by spasm and congestion, there is a valvular action whereby air drawn in by the strong inspiration can enter the alveoli but cannot escape. Accordingly the asthmatic has difficulty in expiration. The chest is over-distended, air is pent up in the lungs, and there is insufficient gaseous exchange, i.e., a condition of gross functional emphysema. When the attack passes off, conditions return to normal. During an attack the breathing is of the thoracic type and the accessory muscles are fully contracted. The diaphragm is depressed to its maximum extent and is seen to be making spasmodic contractions or none at all. The more dyspnœic the patient becomes the more he endeavours to *inspire* and so over-distends his already fully inflated lungs. In chronic cases the typical permanent asthmatic deformity of the chest results—kyphosis, pigeon chest, and Harrison's sulcus. This is due to actual shortening of the fibres of the diaphragm, intercostal and accessory muscles from prolonged spasm. The chest expansion at the fourth rib is decreased to about 1 in. and the vital capacity

is grossly diminished. For these reasons the aims of breathing exercises should be :—

1. To empty the lungs by increasing the expiratory phase.
2. To re-educate the automatic diaphragmatic movements and to diminish the thoracic type of breathing.
3. To relax spasmodically contracted muscles.
4. To mobilise the ribs and chest wall and to correct kyphosis.

Various types of simple exercises can be devised to fulfil these requirements and examples of such exercises are given in a booklet recently published by the Asthma Research Council (1934).[5]

We find it best to teach patients to take a *short* inspiration through the nose and then to make a *long* expiration through the mouth, with a whistling or hissing noise; this concentrates the attention on the expiratory phase. During expiration the epigastrium must sink in, to ensure that the diaphragm rises in the chest. (Female patients are forbidden to wear tight corsets.)

A good deal depends on the personality of the teacher: she must gain the patient's coöperation in practising the exercises two or three times daily for at least ten minutes, over a prolonged period; she must also try to enthuse him with the benefit he is likely to obtain from the treatment. She must warn him that at first the exercises may make him worse by causing coughing and wheezing, which are produced in the majority of cases on full expiration. This loosens the mucus, which is presently coughed up, to the patient's relief. She must also persevere until the patient acquires habitual diaphragmatic breathing.

The patient is encouraged to practise the exercises, gently, when he feels an attack is imminent, in order to abort it.

ROUTINE OF INVESTIGATION AND TREATMENT

In each case a complete history was taken and a clinical examination made, including measurements of the chest expansion and screening of the diaphragmatic movements. In all cases suspected of nasal disease a laryngologist's report was obtained. The home conditions were investigated in considerable detail by the almoner's department; every patient kept a record of his attacks or wheezing in a notebook, which was inspected at each visit to the clinic.

Of the routine investigations, only those relevant to the subject will be discussed in this paper; the results of the remaining investigations will be dealt with in separate articles.

As far as possible all cases were treated in the same way. Attendance for instruction in breathing exercises was required twice weekly at first and at longer intervals as the patients progressed During the first few weeks of treatment a mixture containing Potassium Iodide gr. v., Tinct. Camph. Co. ℥ xlv., and Tinct. Stramonium ℥ x., was given in some cases, and ephedrine or ephazone tablets for the attacks; these drugs were withdrawn as the cases improved. The patients were instructed not to take late meals. Other therapeutic measures, such as vaccines, nasal operations, and removal of sensitising proteins (feathers, dust, foods), were rigidly avoided, even though they were obvious causative factors, in order that the full value of breathing exercises might be gauged.

CLINICAL RESULTS

It is difficult in an alternating and paroxysmal condition such as asthma to assess the results of treatment in a scientific manner; as has been said before, we do not consider that a year's observation is sufficient to warrant the use of the term "cured" in any case. Accordingly, we have used the following terms as conveying best, in our opinion, the varying gradations of the patient's condition :—

Excellent (E.).—Cases free from all wheezing or attacks of asthma but still doing breathing exercises.

Very good (V.G.).—Cases having an occasional wheeze but no real attacks; still doing breathing exercises.

Much improved (M.I.).—Cases which are very much better, although still having occasional attacks and wheezing.

Improved (Imp.).—Cases showing only slight improvement.

Failure (F.).—Cases showing no improvement, although the exercises have been conscientiously practised.

This report is based on the study of 75 cases, of which 38 were male and 37 female. The ages varied from 3 to 75 years, 21 cases being under 15 years of age. Other manifestations of allergy (hay-fever, eczema, and so forth) were found in 32 cases. A family history of allergy was found in 51 cases.

The cases were divided into two groups, "allergic" and "bronchitic."

By *allergic* is meant cases which are hypersensitive to certain substances, as judged from their history or response to skin tests. As a rule the onset of symptoms is in early life, and there is a positive family history of other allergic conditions—namely, hay-fever, eczema, migraine, and urticaria; 49 cases came into this group.

By *bronchitic* is meant cases in which the asthma seems to follow or be related to bacterial infection of the respiratory tract; 26 cases came into this group.

Table I. shows the clinical results, at the end of one year, of a group of 75 cases treated by breathing exercises alone and compared with a control group of 50 similar cases, in which the treatment has been specially selected, e.g., removal of various antigens (feathers, dust, foods, &c.) to which the patients were sensitive, vaccines for the bronchitic type, nasal operations, hydrochloric acid for the achlorhydric, and various specific and non-specific desensitisation for others.

TABLE I.—*Results of Treatment*

Results of 75 cases treated by breathing exercises alone.					Control group of 50 cases treated by special methods.	
Result at 1 year.	Allergic.	Bronchitic.	Total Nos.	Distinct clin. imp.	—	Distinct clin. imp.
Excellent ..	10	3	13	52 out of 75 cases.	14	36 out of 50 cases.
Very good ..	17	8	25		14	
Much improved..	10	4	14		8	
Improved ..	4	8	12	—	3	—
Failures ..	8	3	11	—	11	—
Total ..	49	26	75		50	

Clin. imp. = clinical improvement.

Distinct clinical improvement can be claimed in 52 of the 75 cases treated by breathing exercises alone, i.e., those placed in the first three groups; these 52 include 37 of the 47 allergic cases and 15 of the 26 bronchitic cases. It will be observed that the proportion of good results is very similar to that in the group of 50 cases treated by special methods, of which 36 showed distinct clinical improvement. In our opinion this is strong evidence in favour of the value of this simple form of treatment.

The exercises require considerable effort by the patient and success is not likely in lazy or

TABLE II

No.	Sex.	Age.	Duration of disease in years.	Type.	Season.	Diaphragm movements.		Average number of attacks per three months.		Aver. number of attacks and wheezes during first three months of treatment compared with number in same three months one year later.		Clinical results of cases.
						Before B.E.	After B.E.	Before treatment.	During year of treatment.	Attacks.	Wheezes.	
49	M.	30	1	A.	Any.	V.G.	V.G.	90	0	0 : 0	1 : 0	E.
32	M.	60	7	A.	,,	M.	V.G.	90	2·25	18 : 9	30 : 1	V.G.
113	M.	9	0·5	A.	,,	V.G.+	V.G.+	90	10	21 : 4	21 : 4	M.I.
94	F.	36	11	B.	,,	V.G.	V.G.	30	3·8	8 : 2	58 : 90	,,
115	M.	75	34	B.	W.	G.	G.	3	5	14 : 1	85 : 82	Imp.
27	M.	36	3	A.	S.	—	—	90	7	22 : 2	52 : 105	,,

B.E. = Breathing exercises. A. = Allergic. B. = Bronchitic. S. = Summer. W. = Winter.

unconscientious cases; this type of patient will probably prefer desensitisation treatment, which depends on the physician's efforts rather than on his own. We are trying to show that there is a simple form of therapy which gives good results in those patients who are anxious to help themselves.

The relation between the clinical results and the duration of the disease shows, as would be expected, that the longer the duration of the condition the greater the number of failures:—

Duration in years.	Cases.	Failures.
Over 20	9	4
From 10 to 20	16	2
,, 5 ,, 10	11	1
,, 1 ,, 5	32	4
Under 1	7	0

In this series the females seemed to do better than the males, 27 out of 37 cases being very much improved as opposed to 25 out of 38 males. This holds true for all ages. The number of cases is of course too small for any generalisation.

The nomenclature used in Table I. does not quite show the difference between patients who before treatment had had daily attacks which were reduced later to one or two per week, and patients who before treatment had only a few attacks per annum which were reduced later to about half the number. Both are classed as "improved." In order to bring out this difference we have prepared a table based on the number of attacks before and after treatment, as defined by each patient in their asthma record books. This method of assessment corresponded very closely with the nomenclature used in Table I. A few examples are given in Table II. to show the details recorded. The table shows the basis of our clinical classification, and gives a good idea of the progress of the case. For example, Case No. 94, a housemaid, although still having slight daily wheezes, is no longer having so many or such severe attacks. Case No. 27, also, although having more wheezing than before, is getting fewer and far less severe paroxysms; he expresses himself as being "very much better." We have grouped him under the heading "improved" rather than "much improved" because he is having more frequent wheezes than before.

DIAPHRAGMATIC MOVEMENTS

Observation of the diaphragmatic movements by screening before treatment showed good excursion in 38 of the 75 cases. Sixty-two of the cases were re-screened after treatment. In many of these we observed a very big excursion of the diaphragm. As would be expected, before treatment was begun good diaphragmatic movements were found in a larger proportion of the males than of the females. However, after treatment, when the females had learned to use the diaphragm, this difference was no longer apparent.

CHEST MEASUREMENTS

The chest expansion at the level of the fourth rib and of the epigastrium was measured before treatment and afterwards at three-monthly intervals. Before treatment, in most cases, the chest expansion was poor, especially at the epigastrium, whereas afterwards it improved. Those patients who had naturally a good epigastric expansion, or acquired this with treatment, improved clinically and vice versa. The actual measurements varied with the type, age, and sex of the individual, but on the whole an expansion of at least 2½ in. at the fourth rib and 2 in. at the epigastrium was obtained by those who improved markedly as regards their asthmatic condition. Details of these observations will be given in a subsequent paper on respiratory efficiency in asthma.

OBSERVATIONS BY THE PATIENTS

About half of the patients who have done well clinically state that they can abort all but very severe attacks by doing breathing exercises. Many of the bronchitic cases also find that, although they still have attacks of bronchitis, these are no longer accompanied by attacks of asthma. A few patients say that they have far less bronchitis than formerly.

DISCUSSION

The results show that half of the cases, 38 out of 75, are, for all practical purposes, symptom-free. In a further 14 the clinical condition is markedly improved. Considerably better results have been obtained in the allergic than in the bronchitic group. This difference is mainly accounted for by repeated attacks of bronchitis in the winter months; better results in the bronchitic group are, in our view, likely to be obtained by combining vaccine therapy with breathing exercises. (Incidentally asthmatic patients are very much more sensitive to vaccines than ordinary bronchitics, and should be given not more than 1/100 of the average dose.)

The better results obtained in the female cases depend on the fact that most of these were poor diaphragmatic breathers; there was consequently

more scope for improvement among them and a larger proportion acquired control of the diaphragm after breathing exercises. An important factor in this connexion is that the females had discarded tight corsets, which entirely prevent natural abdominal breathing. The age of the patient did not appear to influence the clinical improvement as much as did the duration of the disease. Indeed, it is surprising to observe the degree of chest mobility and diaphragmatic movement obtained in some of the elderly patients.

In comparing the control group, in which treatment was specially selected, with the group treated by breathing exercises alone, the proportion of good results is seen to be practically the same. This, in our opinion, points to the value of breathing exercises as a practical form of therapy, since equally good results were obtained with this simple treatment as with the more complicated and specific measures practised in the control group.

When the movements of the diaphragm and epigastrium are considered in relation to the clinical results, it appears that patients with good movements originally did better than those with poor movements; if, however, the latter acquired good movements the clinical condition was also for the most part improved. For success it is necessary to obtain: (*a*) A chest expansion at the fourth rib of at least 2½ in. (*b*) An epigastric expansion of at least 2 in. (*c*) A good diaphragmatic excursion during normal breathing. (*d*) Complete control over the full range of diaphragmatic movement. (*e*) The ability to dissociate thoracic from abdominal breathing at will. In addition to these purely physical aspects, there is also a psychological aspect of this treatment: (*a*) The patient is encouraged to aim at aborting the attacks by the exercises. (*b*) It is thereby suggested that the treatment lies in his own hands. (*c*) This régime entails a certain amount of perseverance and effort on the part of the patient and is therefore excellent discipline.

SUMMARY

(1) In 75 cases of asthma treated for one year with expiratory breathing exercises, good clinical results were obtained in 52, improvement in 12, and no improvement in 11 cases.

(2) The improvement seemed to depend upon the patient acquiring mobility of the chest, natural diaphragmatic breathing, and control of the diaphragm. There is also a considerable psychological factor.

(3) The treatment requires perseverance and effort on the part of both patient and teacher over a considerable time.

(4) A number of patients were able to abort impending attacks by these exercises; this appeared to be due to loosening and expulsion of mucus, rather than to any other factor.

(5) This method of treatment is simple and applicable in all cases; it is sound treatment from the physiological point of view. In this series 11 out of 75 cases were unable to learn diaphragmatic control.

(6) In spite of the fact that good results are claimed from breathing exercises alone, it is held that specific treatment should not be neglected—e.g., removal of feathers, foods, and so forth—or operation in gross nasal disease.

Our thanks are due to Miss Dorothy Hague who founded the Hague Asthma Research Scholarship, which one of us (M. G.) has held, and to the anonymous donors who provided funds for the apparatus and general expenses. We are especially grateful to Miss C. I. Mackness of the almoner's department and to Mrs. M. K. Stratford and Miss J. M. Reed of the physiotherapeutic department, whose perseverance and hard work have been invaluable.

Lastly we thank the patients forming the subject of this reasearch, who have undergone, without complaint, the discomfort associated with the repetition of the various investigations.

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STABILISATION OF THE ACROMIO-CLAVICULAR JOINT

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THE acromioclavicular joint is essentially stable and secure, owing these qualities not so much to the capsular ligament investing the joint as to the coracoclavicular ligament, an extracapsular ligament which has no direct connexion with the joint itself. Were it not for the conoid and trapezoid ligaments, the component parts of the costoclavicular ligament, this joint would be relatively weak and dislocation would of necessity occur frequently. The anterior components of the trapezius and deltoid muscles attached above and below the outer end of the clavicle respectively, help to stabilise the joint further.

ANATOMY

The articular surfaces of the clavicle and acromion respectively are cartilage-clad, ovoid areas, the long axis of which is from before backwards. Further, the articular surfaces are so inclined that the clavicular surface looks downwards and outwards, while that of the acromion faces upwards and inwards. The ligamentous capsule investing the joint is complete, but is somewhat thicker above and below than it is in front and behind. Between the two articular surfaces is a very variable interarticular disc which is usually incomplete, but in rare cases may be complete and then subdivides the joint into two independent synovial cavities. Owing to the configuration of the two articular surfaces, in the form of two inclined planes opposed one to the other, the outer end of the clavicle is liable to be so relatively displaced as to ride upwards and outwards upon the acromion. This may occur without any disturbance of the coracoclavicular ligament, and results in a partial dislocation or subluxation of the joint.

Should the region of the point of the shoulder be the seat of very severe trauma, the outer end of the clavicle is usually fractured. Occasionally, however, complete dislocation of the joint, which can only occur when the coracoclavicular ligament is ruptured and the neighbouring muscle damaged, results (Fig. 1). In such cases the outer end of the clavicle may be displaced: (1) upwards; (2) backwards and downwards; (3) forwards and downwards;

(4) backwards, depending upon the direction in which the dislocating force is applied. In complete dislocation the outer end of the clavicle is most commonly displaced upwards, an accident which may result from a sudden violent thrust impinging downwards upon the acromion, and often accentuated by contraction of the trapezius muscle. If the severity of the dislocation is uncertain, the injury should be examined radiographically in order to determine whether the coracoclavicular ligament is ruptured or not. When this ligament is ruptured, a small flake of bone torn from the under side of the clavicle is often visible in the radiogram.

FIG. 1.—Drawing from a skiagram showing a complete dislocation of the acromioclavicular joint.

TREATMENT

Subluxation of the coracoclavicular joint, when the outer end of the clavicle is displaced upwards and outwards upon the acromion, is easily reduced. The shoulder should be raised and carried backwards while the outer end of the clavicle is subjected to pressure downwards. The arm is placed at the side; a piece of padded leather is placed over the joint, and a broad piece of strapping is applied with its centre at the elbow; its two ends are carried one in front and one behind, up to the shoulder, and are then made to overlap the pad which is placed over the injured joint. The arm is then fixed to the side by a bandage. The strapping should be retained in place three weeks, and after its removal the arm should be kept in a sling for another fortnight. Subluxation is liable to recur, but little functional disability is usually caused thereby.

In cases where the dislocation is complete, owing to the rupture of the coracoclavicular ligament, and in those cases where the displacement is disfiguring, an operation gives very good results.

The joint is exposed by an anterolateral incision passing through the anterior fibres of the deltoid muscle. Two horizontal holes are drilled through the outer end of the clavicle and the acromion in such a direction that they lie parallel to each other and to the joint line. When drilling the holes it is very important not to traverse or encroach upon the cartilage encrusting the joint surfaces. A piece of silver wire is threaded through the holes, as shown in Fig. 2, and the joint is stabilised by being surrounded and braced by the wire. The ends of the wire are drawn together and so twisted as to form a knot which is buried beneath some of the fibres of the deltoid muscle. The incision is closed by inserting a few interrupted catgut sutures into the separated deltoid muscle-fibres and completed by stitching the skin with a continuous silkworm-gut suture. Dressings are applied and the arm is bandaged to the side for a week; after this the bandage is removed and the patient is encouraged to move the arm as much as possible.

END-RESULTS

Although I have performed this operation five times since 1915, an interval of 20 years has elapsed before I had the opportunity of seeing the patient on whom I first operated. This prompted me to investigate the results of the other four cases.

Case 1.—A. B., aged 25, a baker, was thrown from his cart in October, 1914, when his horse bolted. He fell on to the point of his shoulder and on admission to hospital was found to have a dislocation of the outer end of his clavicle. This was confirmed by radiography, and the joint was immobilised with strapping. After three weeks the strapping was removed and the patient wore a sling for two weeks while he attended for massage and electrical treatment. He returned to work in December, some seven weeks after his accident, but soon found that he could not do any work in the bakery which necessitated using his shoulder muscles, as the bone became displaced and hurt him. He was examined again in January, 1915, and found to have a complete dislocation of the acromioclavicular joint, and owing to the free mobility of the outer end of the clavicle it was decided to stabilise the joint by a wire suture surrounding the joint. This was performed according to the method described above, and the patient did very well, left hospital on the fifteenth day and was back at work six weeks after his operation. In January, 1935, the patient was operated upon for acute appendicitis and made a good recovery. His acromioclavicular joint was examined and found to be absolutely stable. The patient stated that he had never had any trouble since the day of his operation, just 20 years previously. The anatomical and functional result was excellent and the scar of the original operation could hardly be seen.

Case 2.—C. D., aged 32, a builder's labourer, was hit on the point of the shoulder by a falling plank in September, 1915, and was admitted to hospital with a badly contused right shoulder and a complete dislocation of the acromioclavicular joint. No strapping could be applied as the swelling was too great, and no pad over the joint could be tolerated on account of the pain. After ten days in hospital the swelling had subsided, and the joint was strapped for a month. When the strapping was removed the joint was found to be very unstable, and the man asked to have the joint stabilised. At the end of October the joint was exposed and stabilised by encircling it with a piece of silver wire. The result was good and the patient was discharged from hospital 14 days after the operation. No late end-result can be obtained in this case, except that the man joined the army at the end of 1916 and was killed in France in 1917. However, it may be assumed that the result was anatomically and functionally good or the man would not have been taken for active service.

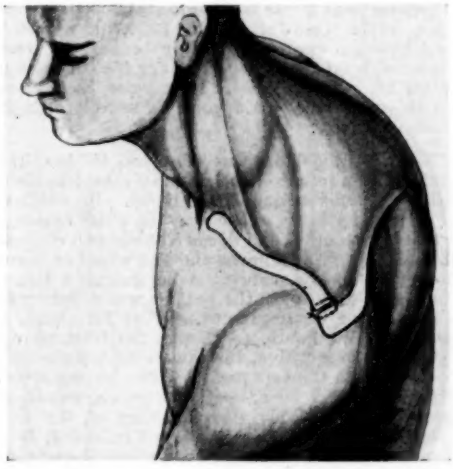

FIG. 2.—Drawing from a skiagram showing stabilisation of the acromioclavicular joint.

Case 3.—E. F., aged 25, a naval stoker, was admitted to the Royal Naval Hospital, Queensferry, in July, 1916, with a complete dislocation of his right acromioclavicular joint, with considerable bruising of the surrounding tissues. Eight hours prior to admission, while coaling ship, a bag of coal fell on the point of his shoulder and caused him to fall forward on his face. Radiography showed marked separation of the outer end of the clavicle and the acromion. There appeared to be a small piece of bone torn off the surface of the clavicle in the region of the coracoclavicular ligament. The joint was firmly strapped for a week to allow the bruising to subside. After this time the acromioclavicular joint was found to be very unstable and weak, and the displacement of the clavicle very obvious. It was considered advisable to stabilise the joint, as his work as a stoker required forcible muscular movements, and coördination in the shoulder and acromioclavicular joints. The joint was stabilised by wiring in August, 1916, and the patient returned to his ship in October. This patient is now a petty officer and is quite fit and has no trouble in, or deformity of, his joint, after a period of nearly twenty years.

Case 4.—G. H., aged 30, was admitted to hospital in June, 1919, three hours after a motor accident. He was riding a motor cycle, and collided with a motor-car and was thrown on to his left shoulder. He sustained a subcoracoid dislocation of the left shoulder-joint and a complete dislocation of the left acromioclavicular joint; he also suffered from concussion and some scalp wounds. The scalp wounds were dressed and stitched, and the dislocation of the shoulder-joint was reduced without any anæsthetic. He made a slow recovery, and after three weeks, in spite of careful bandaging, the acromioclavicular joint was still very mobile, and owing to the fact that the patient had also suffered from a subcoracoid dislocation of the shoulder-joint it was decided to stabilise the acromioclavicular joint. On July 16th, 1919, the joint was stabilised by open operation, mainly because the rest in bed was considered to be beneficial for his concussion as well as for his other injuries. It has not been possible to trace this patient as he appears to have left England for America in 1927.

Case 5.—I. J., aged 42, was admitted to hospital in April, 1922, with a fractured pelvis and a complete dislocation of the right acromioclavicular joint. He attempted to stop a runaway horse and cart; the shaft apparently caught him on the outer end of his clavicle and dislocated it; the man was thrown down and the wheel of the cart passed over his pelvis, causing a comminuted fracture. When admitted to hospital the patient was suffering from severe shock, and no treatment, except for shock, was attempted for some hours. Although the fracture of the pelvic girdle was extensive, there were no injuries to the pelvic organs or to the soft parts. After having a strong pelvic binder applied for a week, the pelvis was encased in plaster-of-Paris. When the bruising of the tissues about the acromioclavicular joint had subsided, it was found that the joint was completely dislocated and almost flail, as there had been considerable damage to the muscles attached to the outer end of the clavicle. Five weeks after the injury the acromioclavicular joint was stabilised by wiring, and some of the torn fibres of the deltoid muscles were united to the outer end of the clavicle. The result of the operation was most satisfactory. When the patient left hospital nine weeks after the operation the acromioclavicular joint was firm and the anatomical and functional results were excellent. This man is still at work as a labourer and when seen in January, 1935, had no disability whatsoever from the severe injuries which he sustained in 1922.

Although I have only had five personal cases in which this joint has been stabilised, I have seen several others in consultation with other surgeons, and the results of operative treatment have been consistently good. Operation is only required in the few cases in which a complete dislocation occurs, but the view that no operative interference is ever indicated in dislocation of the acromioclavicular joint is obviously untenable.

WORKING CAPACITY AFTER DUODENAL AND GASTRIC ULCERS

A RECORD OF 430 CASES

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As probably the largest and most various employer of labour in the country, with accurate sick records of many thousands of employees of both sexes between the ages of 14 and 60, the Post Office is advantageously placed for the observation, under ordinary industrial conditions, of many common disorders. It is also able to present, from certain points of view, a perhaps more detailed after-history of many such conditions than is possible to the follow-up departments of hospitals or of individual surgeons and physicians. For this reason it is felt that the following tables may be of some general interest. They record the actual subsequent sickness incurred, under ordinary working conditions, of an unselected series of 200 cases operated upon for duodenal ulcer; 40 cases of duodenal ulcer, confirmed by hospital or X ray investigation, but medically treated; 150 cases operated upon for gastric ulcer; and 40 cases of gastric ulcer, confirmed by hospital or X ray investigation, but medically treated. The period of observation varied from not less than 3 to 20 years. The records are, in all cases, of *subsequent* sickness, the initial sickness incurred either by operative treatment or the original investigations confirming the diagnosis being excluded. Subsequent sickness due to purely traumatic causes, such as the fracture of a limb, has also been excluded.

The object of the research has been primarily to discover the sort of health that may be expected, under ordinary industrial conditions, in these cases and not to demonstrate the relative values of any particular form of medical treatment or surgical technique. Where it has been possible, however, in the surgical groups, to trace the nature of the operation performed this has been indicated. It should perhaps be emphasised, in explanation of the relatively small number of cases in the tables of medically treated duodenal and gastric ulcers, that only those have been included in which the diagnosis was confirmed by X ray or special hospital investigations, thereby excluding a very much larger series in which the diagnosis was based on clinical grounds alone.

REFERENCES TO TABLE I

(*see opposite page*)

G.-ent. = gastro-enterostomy; G.-jej. = gastro-jejunostomy; Perf. = perforation; G.U. = gastric ulcer; LPT = later pulmonary tuberculosis.

(*a*) Developed chronic pancreatitis three years later.
(*b*) Operation for gastric ulcer eight months later.
(*c*) Operation for perforated gastric ulcer nine months later.
(*d*) Second operation three years later.
(*e*) Second operation eight years later.
(*f*) Operation for removal of adhesions and appendix four years later.
(*g*) Operation for gastric ulcer four years later.
(*h*) Later pulmonary tuberculosis.
(*i*) Second operation three years later.
(*j*) Operation three years later for gastric ulcer.
(*k*) Second operation 11 years later.
(*l*) Second operation four years later.
(*m*) Operation for cholecystectomy 13 years later.

TABLE I.—DUODENAL ULCERS SURGICALLY TREATED (*see references on previous page*)

(A) MANUAL WORKERS (118 Cases)

Case.	Sex.	Age at operation.	Years of subsequent observation	Total number of sick absences.	Average annual sick absence for digestive disorders.	Average annual sick absence from all causes.	Date of first operation and remarks.
1	M.	34	3	9	25·7	68·0	1924. G.-ent.
2	M.	53	7	11	1·9	7·6	1922. ,,
3	M.	39	4	14	9·2	39·7	1918. ,,
4	M.	31	3	8	25·7	28·7	1930. Perf.
5	M.	34	4	57	61·0	86·0	1924.
6	M.	55	4	22	40·7	49·2	1926. G.-ent.
7	M.	48	3	7	72·0	76·0	1926. ,, (*a*)
8	M.	48	11	37	14·2	37·0	1922. Perf.
9	M.	53	6	9	5·8	13·5	1925.
10	M.	38	12	33	71·3	82·5	1916. Perf.
11	M.	44	10	19	21·0	31·7	1924.
12	M.	31	9	46	2·3	15·8	1915.
13	M.	42	6	21	31·6	33·2	1926. G.U. (*b*)
14	M.	44	14	37	22·4	40·7	1919. G.-ent.
15	M.	48	9	11	0·7	23·8	1924. G.-jej.
16	M.	39	14	25	16·7	27·2	1921.
17	M.	25	9	28	15·7	19·2	1925.
18	M.	44	8	2	Nil.	2·4	1926. G.-jej.
19	M.	45	4	11	1·5	32·7	1930.
20	M.	42	6	5	49·2	53·0	1923.
21	M.	26	3	5	7·3	10·0	1931. G.-ent.
22	M.	35	3	12	7·3	15·0	1931.
23	M.	29	8	32	4·0	15·8	1926.
24	M.	34	18	41	18·0	20·1	1916. Perf.
25	M.	39	5	27	48·6	76·0	1929.
26	M.	53	5	9	18·2	93·0	1929. LPT
27	M.	39	9	3	5·9	5·9	1925.
28	M.	35	10	20	5·6	21·6	1925.
29	M.	37	6	7	33·6	37·8	1928. G.U. (*c*)
30	M.	24	3	11	128·3	128·3	1929. (*d*)
31	M.	27	10	6	5·4	6·9	1924.
32	M.	31	6	10	0·3	1·7	1929. Perf.
33	M.	40	12	21	17·2	84·0	1922. Perf. LPT
34	M.	35	12	13	28·1	36·5	1922. Perf. (*e*)
35	M.	52	8	22	0·9	58·6	1925.
36	M.	39	10	25	0·3	7·7	1924. G.-ent.
37	M.	33	13	2	Nil.	0·5	1922. ,,
38	M.	36	10	30	6·1	23·0	1924. ,,
39	M.	29	3	7	24·0	33·7	1931. Perf.
40	M.	35	8	22	0·7	5·5	1926.
41	M.	46	10	22	6·8	15·7	1925. G.-ent.
42	M.	40	11	89	66·4	83·2	1923. (*f*)
43	M.	43	4	5	25·2	26·5	1930.
44	M.	48	4	4	Nil.	11·2	1931.
45	M.	38	12	28	16·7	22·8	1923. G.-ent.
46	M.	38	16	21	0·2	5·1	1918. ,,
47	M.	35	12	12	18·7	26·2	1923. ,, (*g*)
48	M.	28	10	14	26·7	50·8	1924.
49	M.	29	3	1	3·0	3·0	1931.
50	M.	44	15	48	15·0	37·9	1919.
51	M.	49	5	3	17·4	17·4	1929.
52	M.	35	5	2	Nil.	2·0	1929.
53	M.	51	8	3	,,	18·1	1924. G.-ent.
54	M.	34	6	15	14·8	19·0	1929.
55	M.	51	9	37	0·9	29·2	1926. G.-ent.
56	M.	40	11	56	4·0	26·6	1923. G.-jej.
57	M.	30	13	80	19·2	32·1	1922. ,,
58	M.	45	7	8	5·6	20·3	1927.
59	M.	44	5	3	5·8	20·8	1929.
60	M.	34	12	11	20·2	32·5	1921.
61	M.	41	5	15	1·0	16·4	1925. G.-ent.
62	M.	30	7	25	14·1	29·3	1927. ,,
63	M.	51	5	17	9·4	28·8	1929.
64	M.	43	4	18	97·7	100·2	1928.
65	M.	34	15	12	2·2	5·5	1919. Perf.
66	M.	40	12	7	5·2	6·8	1923.
67	M.	42	9	18	Nil.	13·9	1925.
68	M.	47	5	15	19·4	27·6	1929. G.-ent.
69	M.	44	7	8	0·3	54·0	1925. ,, (*h*)
70	M.	39	7	8	1·6	4·0	1922.
71	M.	43	12	37	6·5	18·0	1923.
72	M.	36	14	28	5·6	37·1	1920. LPT
73	M.	38	12	23	2·2	10·1	1922. Perf.
74	M.	39	10	18	4·3	10·4	1924.
75	M.	31	15	28	1·7	9·9	1919.
76	M.	46	8	73	36·4	55·6	1926.
77	M.	33	3	9	62·0	87·0	1931. G.-ent.
78	M.	40	5	31	8·0	25·0	1929. ,,
79	M.	47	8	10	Nil.	4·7	1926. ,,
80	M.	38	7	28	44·3	63·3	1920.
81	M.	41	3	3	Nil.	8·3	1931. G.-ent.
82	M.	41	10	9	,,	20·3	1925. Perf.
83	M.	48	9	12	24·0	47·0	1925. ,,
84	M.	41	12	15	0·2	14·6	1923.
85	M.	43	11	29	Nil.	26·4	1924. Perf.
86	M.	40	3	6	64·0	67·0	1926.
87	M.	43	10	59	5·0	49·8	1924.
88	M.	35	11	14	1·1	6·0	1923.
89	M.	39	3	3	22·3	24·0	1932.
90	M.	48	5	2	Nil.	6·2	1929.
91	M.	37	11	4	,,	9·8	1923. G.-ent.
92	M.	41	9	2	,,	0·7	1926.
93	M.	49	10	45	2·6	25·1	1923.
94	M.	36	7	24	40·8	53·3	1928.
95	M.	37	7	16	16·7	24·8	1928.
96	M.	39	4	5	Nil.	6·0	1931.
97	M.	40	13	12	4·7	7·9	1921.
98	M.	46	11	32	Nil.	45·4	1924.
99	M.	41	7	33	10·7	18·6	1928. Perf.
100	M.	36	11	15	10·0	28·4	1923.
101	M.	38	8	7	17·2	18·6	1926. G.-ent.

MANUAL WORKERS—*continued*

Case.	Sex.	Age at operation.	Years of subsequent observation	Total number of sick absences.	Average annual sick absence for digestive disorders.	Average annual sick absence from all causes.	Date of first operation and remarks.
102	M.	40	12	5	0·4	1·5	1923. G.-ent.
103	M.	33	14	4	0·1	0·5	1920. Perf.
104	M.	35	11	20	Nil.	10·3	1923.
105	M.	48	11	6	,,	1·4	1923. Perf.
106	M.	38	11	22	22·0	29·4	1924. ,,
107	M.	41	9	7	1·1	11·0	1925.
108	M.	35	3	6	12·0	30·0	1931.
109	M.	47	3	5	Nil.	17·6	1931.
110	M.	44	9	5	0·1	13·4	1926.
111	M.	39	4	13	7·5	22·7	1930.
112	M.	42	5	6	59·6	61·0	1922. (*i*)
113	M.	41	8	5	4·0	4·9	1926.
114	M.	40	7	6	1·0	4·7	1927.
115	M.	37	7	12	0·4	6·3	1928.
116	M.	35	4	9	52·7	57·7	1930. G.-ent.(*j*)
117	M.	41	8	37	21·1	39·0	1926. Perf.
118	M.	35	13	22	8·6	10·5	1922.

(B) NON-MANUAL WORKERS (82 Cases)

Case.	Sex.	Age at operation.	Years of subsequent observation	Total number of sick absences.	Average annual sick absence for digestive disorders.	Average annual sick absence from all causes.	Date of first operation and remarks.
119	M.	52	7	18	29·4	45·8	1922.
120	M.	48	5	11	Nil.	89·4	1925. G.-jej.
121	M.	53	3	24	14·0	22·0	1923. G.-ent.
122	M.	41	3	9	11·3	145·0	1926.
123	M.	50	9	3	Nil.	1·5	1916.
124	F.	50	5	19	15·8	44·8	1921.
125	M.	51	3	4	125·7	130·0	1927.
126	M.	52	8	5	0·5	3·4	1918.
127	M.	31	11	3	Nil.	4·4	1923.
128	F.	29	10	35	4·7	12·4	1924. G.-ent.
129	M.	31	10	10	16·8	18·3	1924.
130	M.	32	11	12	Nil.	5·9	1923. G.-ent.
131	M.	39	14	31	16·3	29·6	1920. Perf.
132	M.	28	8	19	12·7	27·1	1923.
133	M.	49	10	14	Nil.	9·6	1923. G.-jej.
134	M.	43	10	10	9·3	11·4	1924.
135	M.	42	5	2	0·2	0·4	1929.
136	M.	40	10	42	26·8	34·9	1925.
137	M.	31	7	38	42·6	52·3	1928. G.-ent.
138	M.	37	5	2	Nil.	2·2	1930. ,,
139	M.	37	20	11	,,	9·5	1913. ,,
140	M.	45	13	7	8·5	12·5	1921. G.-jej.
141	M.	49	4	21	58·0	84·5	1929. Perf.
142	F.	42	17	32	5·8	14·5	1916. G.-ent.
143	M.	35	14	13	9·6	15·1	1921.
144	M.	30	6	5	12·5	13·0	1929. G.-ent.
145	M.	24	11	9	Nil.	4·4	1924.
146	M.	47	10	9	,,	15·4	1924.
147	M.	47	11	20	4·6	21·5	1924.
148	F.	50	3	12	23·7	30·7	1931. G.-ent.
149	F.	22	10	19	0·8	22·6	1924. ,,
150	M.	42	9	17	2·0	19·1	1925. ,,
151	M.	33	16	95	29·1	40·8	1918. ,, (*k*)
152	M.	33	13	90	20·3	31·0	1920. ,, (*l*)
153	M.	31	12	39	7·0	8·7	1923. G.-ent.
154	M.	40	13	14	2·8	7·1	1921. ,,
155	M.	48	6	7	12·3	13·5	1929. ,,
156	M.	44	12	11	Nil.	4·7	1922. ,,
157	M.	37	16	26	0·4	6·4	1918.
158	M.	34	13	23	13·1	17·2	1922. G.-ent.
159	M.	40	11	70	9·7	19·0	1923. ,,
160	M.	44	14	13	Nil.	50·5	1917.
161	M.	40	11	4	,,	2·1	1923. G.-ent.
162	M.	20	9	21	5·5	10·1	1926. ,,
163	M.	20	8	9	0·4	2·4	1926. ,,
164	M.	40	12	11	4·0	11·5	1922. Perf.
165	M.	52	8	3	Nil.	4·4	1924. G.-ent.
166	M.	40	15	13	6·1	16·6	1920. (*m*)
167	M.	42	9	8	Nil.	2·4	1925. G.-ent.
168	M.	34	11	25	,,	8·9	1923. ,,
169	M.	40	8	5	0·1	0·6	1925. ,,
170	M.	36	15	57	1·1	11·5	1919.
171	M.	31	7	14	0·6	18·6	1926.
172	M.	50	9	2	4·8	5·1	1925.
173	M.	54	5	8	Nil.	28·8	1930.
174	M.	37	12	5	7·2	9·7	1922.
175	M.	54	3	6	Nil.	42·0	1924. G.-ent.
176	M.	45	5	8	6·8	18·6	1928.
177	M.	56	4	7	8·5	18·0	1926.
178	M.	54	5	22	5·6	38·8	1925.
179	M.	39	12	10	0·2	6·0	1923.
180	M.	50	8	3	Nil.	2·2	1926. G.-ent.
181	M.	46	10	2	,,	1·2	1925.
182	M.	43	6	5	7·7	10·8	1929.
183	M.	34	11	28	21·1	30·9	1923. Perf.
184	M.	49	10	51	19·6	42·0	1923.
185	M.	41	8	7	1·7	5·6	1926.
186	M.	42	10	5	1·0	3·7	1924. Perf.
187	M.	42	10	14	5·4	11·6	1924.
188	M.	40	15	27	8·7	21·1	1920.
189	M.	37	13	43	20·2	31·7	1921. G.-ent.
190	M.	33	15	14	4·9	6·5	1919.
191	M.	46	9	5	Nil.	1·9	1925.
192	M.	38	12	23	8·1	20·2	1922.
193	M.	35	8	13	0·1	3·7	1926. G.-ent.
194	M.	45	10	12	0·9	6·7	1925.
195	M.	40	8	4	Nil.	15·4	1926.
196	M.	52	7	14	22·0	34·0	1923.
197	M.	40	14	16	7·4	17·4	1920.
198	M.	44	6	1	Nil.	1·3	1929. G.-ent.
199	M.	38	8	22	28·7	35·7	1926.
200	M.	42	8	19	19·6	21·7	1926.

From Table I. it will be seen that the average subsequent yearly sick absence of the manual group was 15·6 days for digestive disorders and 28·7 days for illness of all sorts. For the non-manual group the average was 9·4 days for digestive disorders and 21·1 days for illness of all sorts. Of the whole group of 200 cases 24 per cent. incurred an average subsequent yearly incapacity for work of less than a week; 16 per cent. of from 7 to 14 days; 26·5 per cent. of from 14 to 28 days; and 33·5 per cent. of more than a month.

From Table II. it will be seen that the average subsequent yearly sick absence of the manual group was 12·5 days for digestive disorders and 26·1 days for illness of all sorts. For the non-manual group the average was 10·5 days for digestive disorders and 16·2 days for illness of all sorts. Of the whole group of 40 cases, 11 incurred an average subsequent yearly incapacity for work of less than a week; 8 of from 7 to 14 days; 12 of from 14 to 28 days; and 9 of more than a month.

From Table III. it will be seen that the average subsequent yearly sick absence of the manual group was 15·5 days for digestive disorders and 26·9 days for illness of all sorts. For the non-manual group the average was 10·7 days for digestive disorders and 19·7 days for illness of all sorts. Of the whole group of 150 cases 24 per cent. incurred an average subsequent yearly incapacity for work of less than one week; 16·7 per cent. of from 7 to 14 days; 29·3 per cent. of from 14 to 28 days; and 30 per cent. of more than a month.

From Table IV. it will be seen that the average subsequent yearly sick absence of the manual group was 16·4 days for digestive disorders and 30 days for illness of all sorts. For the non-manual group the average was 12·1 days for digestive disorders and 21·4 days for illness of all sorts. Of the whole group of 40 cases, 4 incurred an average subsequent yearly incapacity for work of less than a week; 11 of from 7 to 14 days; 10 of from 14 to 28 days; and 15 of more than a month.

It has been impossible, owing to exigencies of space, to print in detail in the tables each individual sick record, but the number of separate occasions, during the years of observation, given in the fifth column, will help to supply some idea of the distribution of the sick absence. In a very large proportion of the cases observed it was of a more or less uniform character throughout the observed years.

TABLE II.—DUODENAL ULCERS MEDICALLY TREATED

(A) MANUAL WORKERS (21 Cases)

Case.	Sex.	Age at diagnosis.	Years of subsequent observation.	Total number of sick absences.	Average annual sick absence for digestive disorders.	Average annual sick absence from all causes.	Date of confirmation of diagnosis and remarks.
1	M.	49	6	20	53·8	73·5	1928.
2	M.	41	3	9	14·0	44·0	1931. P.T. (*n*)
3	M.	45	9	43	10·5	24·5	1925.
4	M.	43	4	8	28·2	91·2	1930.
5	M.	31	4	4	10·7	15·2	1930.
6	M.	34	5	Nil.	Nil.	Nil.	1930.
7	M.	41	4	7	,,	10·2	1930.
8	M.	42	11	39	16·7	24·4	1924.
9	M.	35	4	5	0·2	3·5	1931.
10	M.	35	15	12	4·3	8·9	1919.
11	M.	36	8	3	1·4	6·5	1926.
12	M.	41	10	23	0·3	2·7	1924.
13	M.	32	10	12	2·4	6·7	1922. G.-ent. (*o*)
14	M.	53	7	5	0·7	1·1	1925.
15	M.	35	6	21	17·7	55·3	1928.
16	M.	35	9	6	Nil.	8·1	1925.
17	M.	41	8	44	27·6	56·9	1923. G.-jej. (*p*)
18	M.	19	9	21	7·5	19·1	1925.
19	M.	43	6	29	15·5	34·8	1928.
20	M.	41	3	5	47·7	47·7	1931.
21	M.	45	10	35	3·6	15·0	1924.

(B) NON-MANUAL (19 Cases)

22	M.	43	4	10	4·7	8·7	1931.
23	M.	45	5	1	Nil.	1·0	1930.
24	M.	42	5	2	6·4	8·4	1930.
25	M.	46	3	5	Nil.	1·6	1931.
26	M.	48	11	16	14·6	15·1	1923.
27	M.	37	12	56	17·3	35·3	1922.
28	M.	35	7	1	Nil.	3·7	1928.
29	M.	32	14	8	6·1	7·2	1919.
30	M.	51	5	4	2·8	4·6	1929.
31	M.	42	8	4	Nil.	17·0	1926.
32	M.	57	3	1	24·3	24·3	1930.
33	M.	39	12	14	Nil.	9·5	1922.
34	M.	37	9	13	4·8	15·4	1923. Op. (*q*)
35	M.	42	3	9	87·0	87·0	1929. G.-ent. (*r*)
36	M.	27	11	20	1·1	9·5	1924.
37	M.	38	5	18	5·0	19·8	1925. G.-ent. (*s*)
38	M.	40	5	4	0·8	5·8	1929.
39	M.	46	8	5	14·6	15·9	1926.
40	M.	48	12	12	10·0	18·6	1923.

(*n*) Developed pulmonary tuberculosis.
(*o*) Gastro-enterostomy ten years later. Subsequently developed pulmonary tuberculosis.
(*p*) Gastro-jejunostomy eight years later.
(*q*) Operation nine years later.
(*r*) Gastro-enterostomy three years later.
(*s*) Gastro-enterostomy five years later.

TABLE IV.—GASTRIC ULCERS MEDICALLY TREATED

(A) MANUAL WORKERS (30 Cases)

Case.	Sex.	Age at diagnosis.	Years of subsequent observation.	Total number of sick absences.	Average annual sick absence for digestive disorders.	Average annual sick absence from all causes.	Date of confirmation of diagnosis and remarks.
1	M.	49	4	15	5·2	10·2	1928.
2	M.	43	4	5	11·7	12·2	1926.
3	M.	37	4	12	39·2	43·5	1931.
4	M.	34	21	17	7·6	14·4	1913.
5	M.	48	4	15	74·5	83·5	1930.
6	M.	46	4	25	75·7	85·0	1931.
7	M.	35	5	15	3·3	7·8	1929.
8	M.	46	5	2	Nil.	3·4	1929.
9	M.	34	4	25	9·0	22·0	1930.
10	M.	37	3	12	25·0	76·0	1931.
11	M.	30	5	17	0·6	18·4	1929.
12	M.	45	9	39	27·2	42·1	1926.
13	M.	42	5	18	2·6	35·2	1929.
14	M.	35	5	15	4·2	5·4	1930.
15	M.	50	6	20	11·8	12·0	1929.
16	M.	35	13	11	0·2	12·7	1922.
17	M.	34	16	53	1·9	8·6	1916.
18	M.	51	3	6	39·3	47·7	1930.
19	M.	39	10	45	35·3	40·1	1925.
20	M.	32	9	33	20·1	27·2	1926.
21	M.	52	7	15	2·1	21·0	1925.
22	M.	47	11	10	0·3	9·6	1924.
23	M.	33	15	35	3·4	15·3	1919.
24	M.	42	9	11	6·5	9·1	1925.
25	M.	42	3	5	0·3	20·0	1932.
26	M.	23	11	33	22·4	26·4	1923. G.-ent. (*ll*)
27	M.	38	6	9	22·0	58·6	1923.
28	M.	51	5	14	13·4	50·0	1929.
29	M.	41	11	8	1·6	10·6	1923.
30	M.	35	4	10	27·5	74·5	1929.

(B) NON-MANUAL (10 Cases)

31	M.	45	6	10	18·0	29·3	1929.
32	M.	49	4	6	7·7	9·5	1931.
33	M.	34	6	21	Nil.	8·5	1928.
34	M.	48	7	19	14·3	18·6	1928.
35	M.	47	10	17	7·6	20·4	1924.
36	M.	31	10	51	36·3	48·6	1924.
37	M.	50	9	9	0·3	5·1	1923.
38	M.	49	10	26	16·7	40·6	1921.
39	F.	30	15	57	18·3	29·3	1920.
40	M.	37	13	9	2·0	4·5	1922.

(*ll*) Gastro-enterostomy for pyloric stenosis 7½ years later.

GENERAL CONCLUSIONS

In so far as the above groups can be considered representative, it would appear that, while there are many individual instances of subsequent good health, the general expectation of working incapacity in cases of proved duodenal and gastric ulceration—however treated, and under ordinary industrial conditions—is definitely high.

Thus of the 430 cases under observation 31·6 per cent. incurred an average subsequent yearly incapacity for work of more than a month; 27·7 per cent. of

TABLE III.—GASTRIC ULCERS SURGICALLY TREATED

(A) MANUAL WORKERS (107 Cases)

Case.	Sex.	Age at operation.	Years of subsequent observation.	Total number of sick absences.	Average annual sick absence for digestive disorders.	Average annual sick absence from all causes.	Date of first operation and remarks.
1	M.	47	4	6	6·7	12·2	1927.
2	M.	38	4	19	5·5	67·7	1922.
3	M.	45	4	13	61·0	84·5	1926. Perf.
4	M.	48	3	7	52·7	61·0	1926. ,, (*t*)
5	M.	56	3	3	Nil.	8·0	1922. G.-ent.
6	M.	55	4	8	5·2	6·5	1928.
7	M.	36	15	31	17·7	24·7	1907. Perf.
8	M.	38	4	8	Nil.	14·2	1924.
9	M.	45	5	1	,,	0·2	1923.
10	M.	48	4	5	13·5	23·2	1926.
11	M.	31	11	30	10·3	56·4	1913. G.-ent.
12	M.	43	10	15	17·3	19·7	1920.
13	M.	54	5	14	Nil.	14·6	1929. G.-jej.
14	M.	52	4	27	40·0	49·0	1930.
15	M.	36	7	37	18·1	20·1	1927. Perf.
16	M.	41	8	31	12·5	16·9	1926. ,,
17	M.	43	8	8	0·9	3·0	1926. G.-ent.
18	M.	47	9	21	19·8	23·1	1926. ,, [ent.
19	M.	47	9	13	Nil.	4·3	1925. Perf. G.-
20	M.	43	9	23	33·5	35·8	1925. Perf. (*u*)
21	M.	37	5	9	Nil.	17·4	1929. Part. gast.
22	M.	31	20	28	1·5	5·7	1914. Perf.
23	M.	37	13	13	12·3	15·7	1922. Perf. (*v*)
24	M.	43	11	22	1·0	14·5	1923. G.-ent.
25	M.	48	3	1	Nil.	0·3	1931. ,,
26	M.	39	9	26	26·9	29·3	1925. ,,
27	M.	29	9	10	1·0	8·1	1925. Perf.
28	M.	46	12	14	11·6	16·8	1923.
29	M.	47	6	16	1·0	7·0	1929.
30	M.	49	9	8	Nil.	10·7	1925. G.-jej.
31	M.	53	7	8	0·1	24·1	1923. G.-ent.
32	M.	39	12	37	12·8	21·6	1923.
33	M.	44	3	2	1·0	4·7	1932. Perf.
34	M.	48	3	7	43·3	61·0	1932. ,,
35	M.	30	7	6	Nil.	3·3	1927. ,,
36	M.	51	9	14	8·9	16·5	1924. G.-ent.
37	M.	41	10	25	34·0	44·2	1924. Perf.
38	M.	35	10	8	4·1	10·6	1924. ,,
39	M.	27	10	7	2·0	2·1	1924. ,,
40	M.	48	9	2	Nil.	0·7	1926. Perf.
41	M.	34	3	13	102·7	110·0	1932. G.-ent.
42	M.	30	18	83	2·5	14·6	1915. ,,
43	M.	50	4	10	72·7	73·5	1928. ,,
44	M.	34	6	10	1·7	2·0	1929.
45	M.	35	8	55	24·0	42·6	1922. (*w*)
46	M.	51	7	27	4·3	11·6	1927. Perf. (*x*)
47	M.	36	10	58	8·4	24·1	1918.
48	M.	42	8	39	15·9	29·8	1927. G.-jej.
49	M.	42	17	13	0·3	3·1	1917. [(*y*)
50	M.	33	10	16	23·4	26·6	1924. Part. gast.
51	M.	42	11	24	18·4	22·5	1924. (*z*)
52	M.	38	12	43	19·1	51·6	1920. G.-ent.
53	M.	42	5	2	1·2	1·2	1928.
54	M.	49	5	4	Nil.	0·8	1929.
55	M.	45	11	36	3·9	24·2	1923. G.-ent.
56	M.	46	8	9	1·5	17·2	1926. ,,
57	M.	40	10	18	61·6	64·1	1924.
58	M.	28	14	45	12·4	22·6	1920. Perf.
59	M.	39	12	47	21·4	28·7	1922.
60	M.	41	7	24	Nil.	10·4	1927. Perf. G.-jej.
61	M.	49	3	30	88·0	127·0	1931. Perf. (*aa*)
62	M.	41	19	9	0·6	3·1	1916. Perf.
63	M.	33	7	11	3·0	7·4	1927.
64	M.	50	7	17	8·4	39·7	1926.
65	M.	33	10	8	2·4	9·8	1925. G.-ent.
66	M.	42	7	41	27·3	70·0	1924. ,,
67	M.	42	8	39	96·5	99·8	1921. ,,
68	M.	55	5	6	2·6	4·4	1929. ,,
69	M.	47	7	30	92·3	102·0	1926.
70	M.	40	9	21	1·5	17·0	1926. G.-ent.
71	M.	45	6	14	1·8	62·5	1926. Perf. (*bb*)
72	M.	45	10	16	17·9	39·1	1923. G.-ent. Died. C.V.
73	M.	38	11	11	0·5	1·7	1923.
74	M.	43	8	28	12·9	51·0	1926. G.-ent.
75	M.	42	8	12	0·2	4·9	1926. Perf.
76	M.	31	4	31	40·7	57·2	1927. ,,

MANUAL WORKERS—*continued*

Case.	Sex.	Age at operation.	Years of subsequent observation.	Total number of sick absences.	Average annual sick absence for digestive disorders.	Average annual sick absence from all causes.	Date of first operation and remarks.
77	M.	27	8	Nil.	Nil.	Nil.	1926. Perf.
78	M.	36	14	34	5·2	7·9	1918. G.-jej.
79	M.	26	5	9	6·4	27·6	1926.
80	M.	43	14	6	Nil.	0·8	1920.
81	M.	34	12	12	18·0	37·9	1922.
82	M.	36	11	33	0·7	6·2	1924.
83	M.	42	8	16	24·0	42·7	1922.
84	M.	42	17	45	23·2	45·0	1915. Perf.
85	M.	31	15	12	Nil.	3·0	1920. ,,
86	M.	42	9	28	9·0	18·2	1926. ,,
87	M.	36	9	10	6·9	11·8	1925.
88	M.	49	7	18	27·6	66·6	1922.
89	M.	26	10	18	9·6	13·0	1924. G.-ent.
90	M.	31	6	6	4·2	9·5	1929. Perf. (*cc*)
91	M.	25	9	7	0·1	7·3	1925.
92	M.	27	10	30	2·4	7·2	1925.
93	M.	46	11	24	7·9	20·2	1923.
94	M.	32	4	14	9·5	26·0	1930.
95	M.	45	8	24	10·2	35·2	1926. [ent.
96	M.	38	3	4	72·3	72·3	1932. Perf. G.-
97	M.	29	4	13	2·2	6·5	1930. Part. gast.
98	M.	42	8	21	1·0	21·1	1926. Perf.
99	M.	31	8	12	44·9	47·6	1926. ,, (*dd*)
100	M.	31	8	20	0·6	4·1	1926.
101	M.	32	12	69	5·3	13·9	1922.
102	M.	49	4	16	67·5	74·2	1930.
103	M.	38	11	26	1·9	20·3	1923. G.-ent.
104	M.	40	10	34	0·2	36·1	1919.
105	M.	43	8	22	2·0	10·3	1926.
106	M.	47	12	17	11·2	16·2	1920.
107	M.	33	10	40	25·3	36·5	1924. G.-ent.

(B) NON-MANUAL (43 Cases)

Case.	Sex.	Age at operation.	Years of subsequent observation.	Total number of sick absences.	Average annual sick absence for digestive disorders.	Average annual sick absence from all causes.	Date of first operation and remarks.
108	F.	51	8	19	2·0	6·6	1918. [ent.
109	M.	56	3	Nil.	Nil.	Nil.	1923. Perf. G.-
110	F.	51	3	9	1·7	22·0	1925.
111	F.	53	7	3	Nil.	2·6	1920.
112	M.	51	6	10	14·8	19·2	1920. (*ee*)
113	F.	32	4	18	1·7	78·0	1914. G.-ent.
114	M.	44	9	9	16·4	17·5	1925. (*ff*)
115	M.	50	3	5	42·3	47·0	1927.
116	M.	39	12	3	5·5	5·6	1922. Perf. (*gg*)
117	M.	43	13	17	Nil.	16·1	1922. G.-ent.
118	M.	34	7	25	1·0	10·4	1927.
119	M.	46	12	20	10·5	29·7	1922.
120	M.	35	5	7	0·8	5·4	1930.
121	F.	44	11	19	16·0	17·8	1918.
122	M.	35	8	19	40·0	42·4	1927. G.-jej. (*hh*)
123	M.	46	11	10	1·5	10·4	1920. G.-jej.
124	M.	25	14	8	Nil.	2·6	1919. Perf.
125	M.	33	16	17	1·1	3·7	1918. ,,
126	M.	28	5	20	74·6	76·4	1926.
127	F.	31	5	15	9·4	14·2	1928.
128	M.	40	5	15	0·2	26·8	1930. Perf.
129	M.	38	11	26	10·4	14·3	1923. G.-ent. (*ii*)
130	M.	40	4	4	Nil.	5·0	1930.
131	M.	18	4	1	,,	2·0	1931. Perf.
132	M.	30	6	2	10·5	14·3	1928. G.-ent. (*jj*)
133	M.	53	6	41	42·3	47·3	1926. G.-ent. (*kk*)
134	M.	29	10	30	2·6	11·8	1924. G.-ent.
135	M.	35	10	20	24·7	26·2	1924.
136	M.	55	5	4	0·4	18·0	1929. G.-ent.
137	F.	19	7	8	Nil.	6·1	1926.
138	M.	44	14	28	4·6	8·8	1919.
139	M.	25	10	23	0·4	9·4	1924. Perf.
140	M.	37	5	7	Nil.	5·2	1929.
141	M.	48	8	16	5·7	10·7	1926. Perf.
142	M.	31	3	1	Nil.	0·3	1931. ,,
143	M.	38	4	13	3·5	54·0	1922.
144	F.	37	11	7	26·7	29·0	1924.
145	M.	33	13	17	7·9	14·2	1921.
146	M.	36	11	3	8·4	28·4	1923.
147	F.	38	5	4	39·4	39·4	1929.
148	M.	40	10	23	18·9	21·4	1917.
149	M.	32	4	8	15·0	21·7	1930.
150	M.	38	16	7	Nil.	7·4	1918.

Part. gast. = partial gastrectomy. C.V. = carcinoma ventriculi.

(*t*) Second operation 12 months later. Gastro-enterostomy.
(*u*) Gastro-enterostomy. Second operation six years later. Partial gastrectomy.
(*v*) Duodenal ulcer three years later. Gastro-enterostomy.
(*w*) Contracted abdominal tuberculosis eight years later.
(*x*) Perforation (subacute).
(*y*) Sixteen months later, gastro-enterostomy.
(*z*) Second operation for adhesions eight years later.
(*aa*) Twelve months later gastro-jejunostomy for duodenal ulcer.
(*bb*) Pulmonary tuberculosis five years later.
(*cc*) Second operation for duodenal ulcer six years later.
(*dd*) Perforation five years later. Duodenal ulcer seven years after original operation.
(*ee*) Died after second operation six years later.
(*ff*) Operation for duodenal ulcer four years later.
(*gg*) Second operation 18 months later.
(*hh*) Second operation two years later.
(*ii*) Second operation one year later for perforation.
(*jj*) Second operation one year later.
(*kk*) Second operation 18 months later for duodenal ulcer.

from 14 to 28 days; 17·7 per cent. of from 7 to 14 days; and 23 per cent. of less than a week—the last-named, from the standpoint of regular working capacity, representing the undoubtedly good results.

Of the 200 cases in the duodenal operation series, 4 afterwards developed gastric ulcers, and 6 required a second operation for the original condition. Of the 40 duodenal cases medically treated, 5 required operative treatment later. Out of the whole group of 240 cases of duodenal ulcer, 4 afterwards developed pulmonary tuberculosis, a proportion large enough to suggest a generally lowered resistance.

Of the 150 cases in the gastric operation series, 6 afterwards developed duodenal ulcers and 9 required a second operation for the original condition; 1 developed pulmonary and 1 abdominal tuberculosis, and 1 carcinoma of the stomach.

It has sometimes been held, from a surgical point of view, that perforated cases, for some obscure reason, have a better subsequent record than others. But in the above groups this has not proved to be the case. In the duodenal operation series, the subsequent average annual sickness incurred in the perforated cases (24) was 16·1 days for digestive disorders and 29·3 days for illness of all sorts, as compared with 12·6 days for digestive disorders and 25 days for illness of all sorts in those where perforation had not taken place. In the gastric operation series the average annual sickness in the perforated cases (41) was 14·8 days for digestive disorders and 23·8 days for illness of all sorts, as compared with 13·9 days for digestive disorders and 25·2 days for illness of all sorts in those where perforation had not taken place.

Turning to the age-distribution, it will be seen that, of the 240 cases of duodenal ulcer, 48 were under thirty-five years of age when the condition was operated upon or otherwise confirmed, 137 between the ages of thirty-five and forty-five, and 55 were forty-six or over. Of the 190 cases of gastric ulcer, 51 were under thirty-five years of age when the condition was operated upon or otherwise confirmed, 85 were between the ages of thirty-five and forty-five, and 54 were forty-six or over. The condition in both series was therefore predominantly one of middle and later life. Although the average yearly sick absence incurred is very considerable in all groups, the type of work performed—manual or non-manual—appears to have a not unimportant bearing on the amount of such sick absence. It will be noted, in the whole series of cases, that manual workers had an average sick absence for all causes of approximately 8 days per year more than the non-manual employees.

Finally there is a general impression that irregularity in the hours of employment and consequently, to some extent, of meal-times may be a predisposing factor in the development of gastric and duodenal ulceration. It has not been possible in the above series to obtain exact data either in support or denial of this. But in this connexion an analysis of a year's sick absence in large groups of employees, made some years ago, may be of interest. In the year in question, 1926, the sick absence incurred from duodenal and gastric ulceration in a group of 70,000 men, mainly engaged upon irregular duties, as compared with such sick absence in a group of 12,000 men of approximately the same status, mainly engaged upon regular duties, was in the proportion of 7 to 6, thus indicating that this factor was probably considerably less important than is usually supposed.

We should like to record our thanks to all those who have assisted in the collection and preparation of the above figures, and particularly to Mr. A. W. Scott, of the Medical Branch of the Post Office.

PUNCTATE BASOPHILIA IN RHEUMATIC CASES AFTER CHRYSOTHERAPY

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Examination of a Leishman-stained blood film from a case of myelogenous leukæmia showed definite punctate basophilic and polychromatic cells. On reference to the case-sheet it was found that the patient had received numerous injections, and as she had been sent into this hospital as a rheumatic condition it seemed possible that gold preparations had been used, and that some of the abnormal red cells might be due to this cause. Her private doctor was consulted on this point, and at the same time other patients receiving or known to have received gold injections were examined. In each case punctate basophils and polychromatic cells were found in the blood.

THE BLOOD PICTURE

So far, 21 cases treated with gold preparations have been investigated and out of these 16 contained both punctate basophils and polychromatic cells; no abnormal erythrocytes have been observed in untreated cases. Toxic symptoms developed in 5 cases; gastro-intestinal disturbances in 4 cases; and albuminuria in 1 case.

As the possibility that these abnormal cells might be present was not appreciated until this accidental finding, the exact time of their first appearance in the blood could not be ascertained; but the more recent cases have been carefully investigated so as to determine the earliest possible moment at which these cells can occur in the course of treatment. Out of 5 patients receiving two injections each, with an interval of 1 week between each injection, polychromasia and punctate basophilia appeared in 4, the patient with no abnormal blood picture having albuminuria. Out of 5 patients receiving three injections each, with an interval of 1 week between each injection, polychromasia and punctate basophilia appeared in 4, the fifth being free from toxic symptoms. Thus it can be stated that these primitive cells can appear after a second, if not a first, injection of gold.

The length of time during which these cells persist in the blood following the last injection of gold has been more readily ascertained. In one case, two courses of gold were given and punctate basophils and polychromatic cells were found 5 months later; in another, after eight injections, the last being 3 months ago, the blood showed the same condition. Another patient to whom gold injections were given 10 months ago revealed abnormal cells, whilst a patient receiving gold 12 months ago showed no abnormality of the red cells. The evidence obtained up to the present thus indicates that these abnormal cells may persist for at least 10 months.

The gold preparations used in the cases examined were sanocrysin and myocrysin. Of 9 cases treated by myocrysin all showed polychromasia and punctate basophilia, whereas, of those treated by sanocrysin, only 1 showed abnormal cells and 1 albuminuria. The dosage given does not seem to influence the appearance of primitive cells; they were observed in 1 case after two injections, equivalent to 0·15 gramme of myocrysin. It is perhaps of interest to note that Gaul and Staud[1] were able to detect gold spectroscopically in the cutis after a dosage of 0·1 g. of gold.

Little deviation from the normal was found in the total red count and in the percentage of hæmoglobin following one or two injections of gold, except possibly for a slight reduction in the total red count which soon adjusted itself to its normal figure. In all the cases examined there was a reduction in the total white count, the average being 4000 to 5000 per 1 c.cm. with a decrease in the percentage of polymorphonuclear cells and a corresponding relative increase in the lymphocytes. The average number of punctate basophils per 100 white cells counted was 3 to 4 cells, but in one case the number in two consecutive counts with an interval of 4 days showed 31 punctate basophils per 100 white cells counted. This patient had received three injections of myocrysin, the total amount being 0·11 g. Polychromasia and punctate basophilia were observed in all the counts made. There were no primitive red cells other than those mentioned.

Attention has previously been drawn to the toxic effect of gold injections and to certain changes in the blood of patients undergoing gold treatment.[2]

The more important changes in the blood were: an increase in the coagulation and bleeding time as observed by Jacquelin and Allanic[3]; leucopenia, with a relative lymphocytosis and an increase in the percentage of eosinophils as observed by Archard and others[4]; and thrombopenia by Secher,[5] in one of whose cases the platelets were reduced to 22,000 per c.mm. following injections which totalled to 1·5 g. of sanocrysin. In his observations on the presence of punctate basophilia as a result of lead therapy for the treatment of malignant disease, Brookfield[6] found, in the early stages, a temporary anæmia due to the destruction of the red cells, this being most conspicuous immediately after the injection of lead and while it was circulating in the blood stream. He observed no change in the white cells and little effect, if any, on the platelet count.

Following the observation of Secher[5] that the effect of gold on the blood platelets is to produce thrombopenia, we have made platelet counts before and during gold treatment of rheumatic patients. In 36 counts no obvious change was observed although the total amount of sanocrysin used in some cases exceeded the figure of 1·5 g. quoted by Secher. Little importance can be attached to the leucopenia with a relative lymphocytosis already mentioned, since this is frequently found in chronic rheumatoid arthritis even before treatment with gold preparations. The highest percentage of eosinophils found in a gold-treated patient was 8, a value which we and others have found equalled in untreated cases.

EFFECTS OF GOLD AND LEAD COMPARED

There is a close relationship between lead and gold injections in that both produce a temporary anæmia; moreover, punctate basophils and polychromatic cells appear in the blood following minute doses, and even after the first or second injections, of heavy metals. Following the use of both gold and lead there is a tendency to return to normal after the injections have been stopped, although with gold preparations it may take nearly 12 months from the date of the last injection.

Various hypotheses have been suggested as to the effect of gold on the circulating blood. Bousser and Weil[1] state that it produces an intoxication of a specific nature in the blood itself or on the bacteria circulating in the blood which, so altered, produces a change in the elements composing the blood. Jacquelin and Allanic[3] suggest that some patients have an idiosyncrasy to gold. Our results have no bearing on the former hypothesis, and the fact that we have found abnormal red cells in a great majority of gold-treated cases lends no support to the suggestion of Jacquelin and Allanic.

In view of the similarity in the blood picture following lead gold therapy it is probable that gold, like lead, causes a local concentration of the basophilic substance which is normally evenly distributed, and so produces the punctate basophilia and polychromasia also found in immature cells. The changes produced by lead and gold are, however, probably reversionary and due to toxic degeneration. Secher[5] emphasises the advantage of using small doses of gold with long intervals between the injections, and we consider this to be a sound policy.

We express our indebtedness to Dr. C. W. Buckley, senior physician to the hospital, for access to many of his cases, to Dr. G. C. Pether for his help with the references, and to our technical assistant, Miss M. Harrison, for the examination of many of the blood films.

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LIPIODOL AS A THERAPEUTIC AGENT

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The value of lipiodol in diagnosis is now well recognised, but its beneficial effect on certain inflammatory conditions may not be generally appreciated. The following cases may encourage others besides myself to use it as a means of treatment.

THE FIRST CASE

A Hokien Chinese woman, aged 26, was admitted to hospital on Feb. 6th under Prof. J. S. English, complaining of severe pain in the joints of the arms and legs, starting about three months previously. Though present in all her joints, it was worst in the small joints of the hands and in both knees, constant, being without intermission. In the other joints there was a vague aching sensation. The knee-joints were maintained in extreme flexion and attempts at extension produced severe pain. There was no thickening of peri-articular structures. Movements at the right elbow-joint were restricted and the interphalangeal joints were in flexion with extension of the metacarpo-phalangeal joints. The thenar and hypothenar eminences of both hands were wasted, more on the right side. No thickening of the ulnar nerves was elicited and the tests for leprosy were negative.

The lower abdomen was found to be tender and she had amenorrhœa and foul-smelling vaginal discharge which dated back to an abortion three months before. The cervix was found to be eroded, the uterus retroverted and retroflexed but not enlarged. The appendages were prolapsed without thickening or tenderness. Vaginal smears showed Gram-negative and Gram-positive cocci in profusion. Nothing of note was discovered elsewhere in the body. There was no fever and the pulse-rate was normal.

The uterine condition was treated by intravenous injections of Trypaflavine and Novalgin combined with glycerin and Protargol vaginal tamponage. It improved rapidly, but the joint affection gradually became worse. On March 9th she received dental treatment for a marginal gingivitis, but still the joint condition progressed.

On April 28th the patient was referred to me as a case of gonorrhœal arthritis. When I first saw her she was lying in bed with both knees fully flexed, thighs flexed on the abdomen, and ankle-joints extended. The muscles of thighs and calves were markedly wasted. The right arm was flexed at the elbow, and wrist and hand were in the claw position. She was greatly emaciated and utterly miserable. There was complete incontinence of fæces and urine. I was unable to move any of the joints affected on account of spasm and pain. Movement under anæsthesia was contra-indicated because of the risk of fracturing the bones. It was considered that the origin of the disease was much more deeply seated than a mere polyarthritis, and accordingly her cutaneous sensations were tested. Owing to the lack of coöperation of the patient the tests were unsatisfactory but sufficient evidence was available to prove paræsthesiæ of both legs and arms.

Next day lumbar puncture was performed. The first tap was made between the 2nd and 3rd lumbar spines, but no fluid dripped from the needle. The 1st lumbar space was then tried with similar result and the 3rd space was tapped, still with negative result. A syringe was attached to the needle and about 2 c.cm. of cerebro-spinal fluid was aspirated with difficulty. The Wassermann and Kahn tests on the fluid were both negative. The fluid was clear, giving a cell count of 2 to 4 per field, chiefly lymphocytes. The total protein was 50–55 with only a trace of globulin.

A tentative diagnosis of chronic adhesive meningitis was made. In order to clear up the diagnosis cisternal pucture was performed on May 2nd under local infiltration and 5 c.cm. of lipiodol was injected. The patient was propped up in the erect attitude for 20 minutes and a radiogram taken. Her condition was very poor during this period. The pulse was rapid and there was profuse sweating and general symptoms of collapse. She recovered somewhat after return to bed, the head being propped up to prevent the lipiodol gravitating to the brain. The following day her general condition had improved, but she complained of severe pain on the right side of the head, neck, and body.

The radiogram showed a block in the subarachnoid space between the 1st and 4th lumbar vertebral levels. The block was incomplete, showing a ragged lower margin and a fine hair-like canal leading down to the level of 3rd lumbar vertebra, thus permitting some of the lipiodol to pass down into the sheaths of the nerve-roots.

I did not see the patient on the day after the lipiodol injection, but on the second day after it I was astonished to find her lying flat on her back with the legs fully extended and flaccid. In this short space of time a marked spastic paresis had been transformed into a flaccid paresis, but most important of all, she had regained complete control of her sphincters, both vesical and rectal. From now on her general condition improved rapidly and her outlook became much more cheerful.

The muscle reactions to galvanic and faradic stimuli were tested and all muscles were found to give a slight reaction, especially to faradic stimuli. The patient was instructed constantly to attempt to move her limbs, and on May 6th she was able to flex the knee and thigh ever so slightly. This fact, however, had an obvious psychological effect on her and she thereafter became a willing coöperator in the treatment. Massage and electrical treatment were given twice daily, and in addition she was put on an iron tonic. The control of the sphincters was maintained except occasionally when the bowels were very loose. On May 21st a set of pulleys was fixed to the foot of the bed and a foot-plate with cord attached was bandaged to the sole of each foot. A weight of 2 lb. was attached to each cord and the patient was advised to flex the legs against the suspended weights. The muscular tone and power increased rapidly under this régime. In addition to the leg movements she was now able to move the right arm freely, although coördination as tested by touching the tip of the nose with the eyes closed was deficient. She put on weight rapidly and was completely changed from her former inert picture of misery to a cheerful and alert person.

On June 3rd—that is one month after the injection of the lipiodol—she was able to sit up in bed and feed herself with solid food, which she had been unable to do for months. The power and coördination of her arm did not, as yet, permit her to carry liquids to the mouth. Two weeks later she was able to walk round her bed holding on to the frame. She still complained of a feeling of weakness and pain on the right side of the neck and right half of the body. I believed the pain to be due to a form of muscular rheumatism, from the long period of disuse, and put her on small doses of sodium salicylate, tincture of opium, and digitalis which appeared to produce considerable improvement.

On July 6th she was able to walk about the ward with the aid of crutches. As she did not appear to improve much after this period, I decided to try the effect of repeating the lipiodol. Consequently, on July 19th the cisterna magna was again punctured and 5 c.cm. of lipiodol injected. The patient showed no signs of distress on this occasion. She was again radiographed and the canal was seen to have opened up considerably although the outline in the lumbar region was still somewhat ragged and there was still a constriction opposite the 4th lumbar vertebra. She was confined to bed for three days after the injection and then allowed up. Progress was now rapid and uninterrupted. She walked out of the hospital, discharged, on August 18th. Her weight on July 29th was 56 lb., and on the day of discharge 68 lb.

THE SECOND CASE

A male Tamil, aged 20, was admitted to hospital on July 6th with a history of having fallen from a tree a distance of about twenty feet. He had lain unconscious in the rain for some hours before being picked up. On admission he had abrasions on the inframaxillary region, great pain in the epigastrium, and tenderness at the base of the thorax and right hypochondrium. The abdomen was slightly distended, but there was no loss of liver dullness. The alæ nasi were moving synchronously with respiration.

I was called to see the case as a possible rupture of the liver, but decided from clinical examination that the condition was concussion of the spinal cord. The patient was kept quiet with morphine, and rectal and hypodermic salines were administered to counteract shock. On the second day after admission the temperature rose to 104·5° F., with respirations 38 and pulse-rate 120, and he had a rigor. This sequence recurred the following day, and on examination of the lungs both bases were found to be dull with fine crepitations. His breathing became very laboured and a pleuritic rub developed. Fluid appeared in the right pleural cavity and his condition became so alarming that his relatives were sent for. The chest was aspirated and 200 c.cm. of fluid resembling pure blood was removed. His general condition gradually improved, but on July 16th he developed frequency of defæcation and was constantly asking for the bed-pan. Two days later he had difficulty in passing urine and had to be catheterised. The following day he became incontinent of fæces with retention of urine and complained of weakness in the right leg. At this period he was very morose, and would not speak nor answer questions.

On July 19th lumbar puncture was attempted but resulted in a dry tap, and because of his condition no further attempts were made on this occasion. On July 29th lumbar puncture was repeated first in the 1st lumbar space, then in the 2nd, but both resulted in a dry tap. The 4th space was next tried with similar result, but with the aid of an aspirating syringe five drops of yellowish-green pus were obtained. This material was sent to the bacteriologist who returned his findings as Gram-negative bacilli of unknown strain.

Having recollections of our previous case I decided to try the effect of lipiodol via the cisterna magna and this was done under local anæsthesia on August 1st. Five c.cm. was injected and a radiogram taken. This showed the

lipiodol scattered about in small globules instead of forming a solid mass outlining the spinal theca. Meanwhile, the loss of control of the sphincters had continued, but on August 3rd—that is two days after the injection of lipiodol—he was able to pass water by himself, although for a few days after, the catheter had to be passed occasionally. Thereafter he regained complete control of bladder and rectum and he began to move the right leg.

The patient was put on a highly nutritive diet with cod-liver oil and tonics and improved rapidly. By August 24th he was walking about with the aid of crutches, and a week later he was able to walk unaided although there was still some weakness and a consequent limp with the right leg. He was discharged from hospital fit on Sept. 15th, able to walk freely but with some weakness of the right leg on running.

COMMENT

These two cases appear to open up a new field in the treatment of subacute and chronic infections of the spinal meninges. In my opinion the good results of injecting lipiodol are due to a chemical inflammation superimposed on the chronic condition, causing absorption of the adhesions, and of any blood clot or pus present, with relief of the œdema of the nerve-roots. Lumbar or cisternal puncture is always followed by a reaction in the cerebro-spinal fluid, but judging from the almost immediate benefit in both these cases after the injection of lipiodol, I am convinced that the iodised oil was the primary factor in producing a return to health.

According to a recent paper by Vincent, Rappoport, and Berdet,[1] remarkable results have been obtained in such conditions as traumatic injuries to the meninges by the simple injection of air by the lumbar route. By this method they claim 70 to 80 per cent. cures in post-traumatic vertigo and headache. In traumatic epilepsy good results have also been obtained. In the encephalopathies of infants, encephalitis, tabes, and general paralysis the results are negative. In their opinion the passage of air in the subarachnoid space dilates the space by mechanical pressure where the canal is narrowed by adhesions. This permits the reduction of œdema which results from congestion, due to kinking of the vessels, particularly the veins, by the adhesions, thus allowing a return to normal of the cerebro-spinal fluid and vascular circulation. According to Craig,[2] lipiodol should not be used in frank inflammatory lesions because of the irritative action on the meninges. I have not had an opportunity of trying lipiodol in pathological lesions of the cerebral meninges, but I would not hesitate to make use of it in selected cases, since Laruelle has used it in a number of cases for encephalography for diagnostic purposes, without untoward results.

SUMMARY

Two cases of localised chronic inflammatory meningitis are reported, both having a certain amount of paresis with loss of control of rectal and bladder sphincters. In both of them lipiodol was injected into the cisterna magna primarily for diagnostic purposes, and in both of them the symptoms were alleviated in an almost miraculous way, with complete cure later.

I have to acknowledge my thanks to Dr. Apparajoo for his careful records and attention to the patients, and to Dr. J. S. Webster, radiologist, General Hospital, for the radiograms.

Since completing this report I have found a reference by Barré [3] to a case of arachnoiditis in which Guillain obtained excellent results by a single injection of lipiodol. No further particulars are given and I am unable to obtain the original paper.

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CLINICAL AND LABORATORY NOTES

A CASE OF BOTULISM

WITH A NOTE ON THE BACTERIOLOGICAL EXAMINATION OF THE SUSPECTED FOOD

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In view of the rarity of botulism a brief record of the symptoms, signs, and course of the first of the present series of cases, together with the subsequent confirmatory investigations, may be of interest.

A woman, aged 50, was admitted to hospital on August 5th with a history of having eaten some vegetarian nut brawn at 9.30 the previous night. On the morning of admission at 9 A.M. she was found by her brother in a rather dazed condition. The patient complained that she was unable to see clearly or talk normally, and later she had difficulty in swallowing. She also vomited and had several fainting attacks. The bowels were opened once in the course of the morning, but there was no diarrhœa. Her brother, aged 69, also took some of the same food but not as much as his sister.

On admission in the afternoon the patient was obviously distressed and cyanosed but had no pain. Her temperature was 97° F., pulse 65, and respirations 20. She answered questions only with the greatest difficulty. There was an obvious bilateral ptosis and the eyelids had to be lifted to see the state of the pupils. Strabismus was marked, the left eye looking downwards and outwards, the right eye looking directly outwards. The pupils were centrally situated, medium and equally dilated. The left pupil reacted to light normally but the right one only very sluggishly. The seventh nerve was unaffected. The soft palate was paralysed. The knee-jerks were present and the plantar reflexes flexor. There was no obvious enlargement or dilatation of the heart; the sounds were feeble and there were no bruits. The movements of the chest were irregular, spasmodic, and incoördinated. The bases of both lungs were dull to percussion and over these areas moist râles could be heard. There was no localised mass or tenderness in the abdomen.

Taking into account the definite physical signs present, together with the history of having eaten the particular food mentioned, botulism was diagnosed. Although the extreme rarity of the disease was fully realised, a special messenger was sent to obtain some anti-botulinus serum from the special department of the Ministry of Health at Colindale, and the medical officer of health was informed forthwith.

The patient's condition became rapidly worse. Her cyanosis increased, air-hunger set in, and the pulse increased to 120 beats per minute before she died 23 hours after ingestion of the suspected food—9½ hours after the first symptom made itself manifest.

DISCUSSION

In arriving at such a diagnosis the possibility of bacterial food poisoning had to be excluded. The absence of diarrhœa and the presence of the definite signs were sufficient to do this. The diagnosis of encephalitis lethargica or poliomyelitis was unlikely owing to the absence of fever; moreover, consciousness until three-quarters of an hour before death, from an infection in the brain sufficient to account for such marked cranial nerve signs, would hardly be possible in a true encephalitis. Again an encephalitis of so fulminating a type would more likely be of the hyperkinetic than the amyostatic hypokinetic and somnolent varieties. No history of the patient having taken any drugs could be obtained.

The incubation period in this case seems to be shorter than the average time quoted by G. Leighton (1924) in the Loch Maree cases. The shortest period before the onset of symptoms in that series of eight cases was 14 hours, while death occurred in 17 hours in one case, the duration of the disease was longer in the other cases. The statement that vomiting denotes an unusually heavy dose of toxin and usually presages a fatal termination (Mathews [1]) seems to be well borne out in this case.

The brother had a heart attack and died soon after hearing of the death of his sister. Shortly before he died he complained that he was unable to speak properly and that his voice seemed unfamiliar to him. At that time there were no ocular symptoms. The difficulty in speech may be significant as he stated quite definitely that he had not taken so much of the suspected food as his sister had. Symptoms of the disease would thus be expected to appear later in his case but might have been masked by the obvious mental distress and precordial pain.

BACTERIOLOGICAL INVESTIGATION

The food consisted of a number of vegetables, including peas, and particles of carrot and other unrecognisable vegetable material. As it was believed that experiments designed to prove the presence of toxin in the food itself were being undertaken at the request of the food inspector, and as only a small quantity of the food was available, it was decided to attempt to grow *B. botulinus* from it and not to attempt to prove the presence of the toxin.

A portion of the food was emulsified in sterile normal saline. The resulting suspension was heated to 80° C. for half an hour, and then thoroughly mixed with melted glucose nutrient agar and glucose nutrient gelatin and grown anaerobically at room temperature. The weather was very warm at this time and growth was obvious in three days although there was not much gas production.

Subcultures were made into glucose nutrient broth. No growth took place in this, possibly because the weather was now much cooler, although some growth must still have been possible as the gelatin cultures which had not liquefied during the first three days liquefied during this period. Subcultures were now made into human serum glucose nutrient broth and incubated anaerobically at 37° C. Growth was apparent in two days and a fresh glucose agar shake put up at the same time showed growth with disruption of the medium.

The serum broth cultures were allowed to grow for a week and then filtered through an L 5 candle. Nine guinea-pigs were injected: one with 1 c.cm. of the serum glucose broth used for preparing the toxin and incubated anaerobically in the same jar as the cultures were grown in; one with 1 c.cm. of undiluted toxin; one with 1 c.cm. of toxin diluted 1 in 100 with normal saline, another with 1 c.cm. of 1 in 1000 toxin, and another with 1 in 10,000 toxin. Four other guinea-pigs were injected with like amounts of toxin and toxin dilutions, and in addition 2 c.cm. of polyvalent anti-botulinus serum obtained from Burroughs Wellcome and Co.

All guinea-pigs given serum survived, as also did that injected with the control serum broth. Those inoculated with 1 c.cm. of undiluted toxin, 1 c.cm. of 1 in 100 and 1 c.cm. of 1 in 1000 toxin died within 18 hours. That inoculated with 1 in 10,000 toxin died in 2½ days, death being preceded by dyspnœa, loss of resistance of abdominal muscles, and paresis of the hind limbs. At post mortem none of the animals that died showed any obvious signs except congestion of the superficial cerebral vessels.

No attempt has yet been made to determine the type of *B. botulinus* responsible as so far it is not certain that the growth is pure.

We are indebted to Dr. A. J. Scott Pinchin under whose care the patient was admitted for permission to publish this case; also to Dr. C. Kitkat for information of the earlier condition of the patient and for sending the suspected food to the hospital.

[1] Mathews, John: A Text-book of the Practice of Medicine, fourth edition, London, 1934, p. 421.

SEPTICÆMIA DUE TO BACILLUS FÆCALIS ALKALIGENES

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A FAIR number of cases of infection by *B. fæcalis alkaligenes* have been described. As a rule it seems to simulate infection by the typhoid-paratyphoid group. Gracey [1] records two cases from Malaya.

CASE A.—Female aged 26. History of three days' fever and vomiting. Patient was six months' pregnant, and labour set in five days after admission. This was followed by rigors and high temperature. Metastatic abscesses developed in the left thigh and left side of the neck. Two months later blood culture gave a growth of *B. fæcalis alkaligenes*. The Widal reaction was negative and the patient ultimately recovered.

CASE B.—Patient was a man aged 26, with swelling of the testicle and epididymis of four days' duration. Abscess of the testicle followed a fortnight afterwards. Examination of the blood and stools was negative. A week later blood culture showed *B. fæcalis alkaligenes*. Similar growth was obtained from the pus of the testicular abscess. Blood-serum from the patient gave positive agglutination against typhosus O up to a dilution of 1–200. This patient also recovered.

Zinsser and Russell [2] quote a case of severe gastro-enteritis as due to this organism, and Gatewood [3] records a case of meningitis in which it was isolated from the cerebro-spinal fluid. The meningitis had followed a cranial operation for a traumatic cyst of the brain due to a fracture of the skull and the patient recovered. Slaboziana and Nasta [4] record fatal peritonitis in twins.

One died 36 hours after delivery and the other when 5 days old. The organism was obtained from abdominal puncture during life. At the autopsy on one of them there was found peritonitis with adhesions, and infarction in the stomach and spleen, but no lesion of the intestine could be made out. Before the confinement the mother had been healthy and labour was normal. The Widal reaction of the blood-serum was negative to typhoid, paratyphoid A,

B, and C, and Gaertner, aertrycke, and Morgan bacilli. It is concluded that a saphrophytic organism in the mother had become pathogenic in the fœtus.

Anderson [5] reports two cases which simulated rheumatic fever; there was a previous history of rheumatism in both, but they did not respond to salicylates. Blood cultures yielded *B. fæcalis alkaligenes*, and the patients made complete recoveries.

The case which came under our observation was that of a woman aged 33, the wife of a pig-breeder. The illness followed upon the labour of a first pregnancy. Delivery had been by forceps. After the confinement and while still in the nursing-home she developed a cracked left nipple. She was discharged from the nursing-home in fourteen days, but after her discharge the left breast became painful and swollen and there was irregular fever.

A month after the confinement she was admitted to hospital with a temperature rising to 100° F. in the evening accompanied by slight headaches. The left breast was œdematous with a small fluctuating mass in the centre of the œdematous area. The breast was opened three days later when a little thin serous pus was obtained. Rubber drains were inserted, but the expected improvement did not occur and very little pus drained from the wound. The temperature became higher and more irregular (99–105° F.) with rigors. The left breast was again opened and drainage-tubes inserted in the fascial space underneath the breast proper. No pus was obtained and none came away in the drainage-tubes. Fluctuating temperature and rigors continued. Erythematous areas appeared over the left arm, shoulder, back, and groin, suggestive of erysipelas but with no raised margins. These yielded to treatment with glycerin and ichthyol. Slight delirium developed in the evenings. The liver and spleen were not palpable and no tenderness or rigidity in the abdomen was evident. There was no suggestion of enteritis nor of uterine infection at any time during the illness. At various times she had treatment by Collosol iodine, intravenous Mercurochrome, and intravenous glucose. The temperature fell by lysis and a month after admission it was normal; but the operation wounds in the left breast still discharged thin serous pus in small amount.

Throughout the illness there was no abnormality in the urine except a slight trace of albumin and a few epithelial casts. Ten days after admission a blood count showed :—

Red cells	2,700,000 per c.mm.	Polymorphs	80 %
White cells	25,300 per c.mm.	Lymphocytes	18 %
Hæmoglobin	43 %	Basophils	2 %
Colour-index	0·8	Eosinophils	2 %

Culture from the blood at the same time gave a pure growth of coliform bacilli having the following characteristics: very faint motility; no fermentation in glucose, maltose, mannite, lactose, sucrose, salicin; and no liquefaction in gelatin. A swab taken from the operation incisions in the breast showed organisms of the same type. The Widal reaction of the blood-serum gave a positive agglutination to *typhosus* O in dilutions of 1–25 and 1–50. The agglutination was completely negative to *typhosus* H, paratyphoid A, B, and C, and *Brucella abortus*. The serum was further put up against suspensions of—

Bact. aertrycke (O sp.)	Slight positive agglutination in dilutions of 1–25 and 1–50.
Bact. aertrycke (H sp.)	Gave similar results.
Non-specific salmonella	Positive in dilution of 1–25.
Bact. gaertner	Positive in dilutions of 1–25, 1–50, 1–125, and 1–250.
Bact. newport	Slightly positive in dilutions of 1–25 and 1–50.

All the other dilutions gave negative results.

The bacillus obtained from the blood was put up against the sera of *aertrycke* O and H, non-specific salmonella, *Gaertner* (H), and *newport*, all with completely negative results. From these investigations it was clear that the organism was *B. fæcalis alkaligenes*.

The husband was a pig-breeder who maintained a fairly large stock of pedigree pigs. In his herd there had previously been outbreaks of what were veterinarily termed infectious necrotic enteritis, swine-plague, white scour, and abortus fever. One of us had the opportunity of examining the premises and carrying out a few more investigations there. The pig-fold was an oblong structure with the pig-sties arranged around the sides. The conditions found were exceedingly primitive and showed gross neglect. The manure from the pigsties had been allowed to accumulate in the fold for many months and the liquid part to drain away as best as it could. The pigs were in very poor condition and many showed extreme malnutrition. The domestic water-supply came from a shallow well which was situated close to a corner of the pig-fold. It could not possibly escape gross contamination from the fold. Three weeks after the patient had been admitted bacteriological examination of the well water showed :—

Number of organisms capable of growing on agar at 37° after two days' incubation	2,220 per c.cm.
Number of organisms growing on agar at 22° C. after three days	10,200 ,,
Probable number of *coli aerogenes* organisms in 100 c.cm. of original water	900.

No. *B. welchii* were isolated, and no *B. fæcalis alkaligenes* found—a somewhat surprising finding in view of the conditions—but examination of the sewage from the fold showed the presence of *B. fæcalis alkaligenes*. In addition we were able to examine one of the young pigs. The intestines though free from visible lesions contained numerous large round worms and cultures taken from the ileum gave growth of *B. fæcalis alkaligenes*. Those from the cæcum and spleen were negative.

The gross contamination of the domestic water-supply in this case might be put forward as a possible source of the infecting organism, though the bacteriological examination of the water did not reveal it. The presence of the organism in the normal intestine has also to be remembered. Investigation has shown the presence of *B. fæcalis alkaligenes* in 19 per cent. of a total of 386 healthy soldiers and in 71·5 per cent. of 126 who were suffering from catarrhal conditions of the bowels. The relatively lowered resistance of the bowel during the puerperium might allow easier access to the invading organism.

Muir [6] states that the organism in question is apt to appear in the intestinal flora in the later stages of bacillary dysentery and disappears as recovery takes place. He points out that the evidence is suggestive that these organisms are pathogenic entities which may be responsible for diarrhœal conditions in young subjects and in adults.

Although the clinical symptoms in these cases are fairly severe the mortality-rate is apparently low and the condition seems to respond well to general treatment. The organism seems to have little or no effect on animals inoculated with it. Association with pregnancy has been noted in other cases, and it was presumably a factor in this case. The patient made a complete recovery and so far there has been no suggestion of recurrence.

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EAST GRINSTEAD'S NEW HOSPITAL.—This new hospital, which is being erected at a cost of £24,000, will be completed and equipped by the New Year. It replaces the existing cottage hospital which has become too small for the needs of the district. Princess Helena Victoria has promised to perform the opening ceremony.

REVIEWS AND NOTICES OF BOOKS

Head, Heart and Hands in Human Evolution

By R. R. MARETT, M.A., D.Sc. Oxon., Rector of Exeter College, Oxford. London: Hutchinson's Scientific Books. 1935. Pp. 303. 10*s*. 6*d*.

OUT of his wealth of experience and learning and in a most agreeable manner the Rector of Exeter College has here put together a number of essays and addresses on the thoughts, habits, and accomplishments of primitive man as revealed partly by the study of prehistoric remains and partly by the current life of savage peoples. The tale he tells so well is of great interest, and readers will be tempted to go further than he does—to link what he says with the doings of animals on the one hand and our own vagaries on the other. They will do so with profit, for running through his descriptions and comments are two main theses—that we must take curious actions as we find them and judge them by their intentions rather than by their apparent effects, and that natural man is not a practical fellow but a mystic with whom moral values weigh more than what our sophisticated scale counts as material advantages. As far as we may judge it, the life of palæolithic man or of the Fuegians may seem to be hardly tolerable; yet, as Dr. Marett shows, they knew how to make it worth while by play and fun and by an intimate contact with a spiritual unknown. Clothes did not start with a liking for being warm but with a fancy for dressing up, dancing is an anticipation of civilised litanies, and through it all is a passion for friendliness. Our only regret is that some parts of the book are not more amply treated, especially in the last section on arts and crafts, where we learn, e.g., that the principle of the Diesel engine was known long ago to wild men in Indonesia. What too is the real rationale of the peculiarly human habit of cooking food? More time and trouble are perhaps consumed on that occupation than on any other human activity, but no explanation of why we do it is wholly convincing and satisfying: possibly it is for the fun of making a fire, or is it to denature the proteins?

La vaccinothérapie dans l'asthme bronchique

Ses Indications. By FEDERICO NITTI, l'Hôpital Bichat et le Service des Vaccins de l'Institut Pasteur. Paris: J. Peyronnet et Cie. 1935. Pp. 141. Fr.12.

THIS is a critical and readable essay on the value of vaccines prepared from the sputum in the treatment of asthma, and though it is based on a slender personal experience it is supported by a good bibliography. Dr. Nitti believes that respiratory infection is common in asthmatics and that it is an important factor both in the initiation and the prolongation of the disease. He considers it unlikely that the proteins of the bacteria act as irritants, to which the patients react in the same way as they react to pollen, dander, or similar allergens, for skin tests show that asthmatics are not more sensitive to bacteria isolated from the respiratory tract than are chronic bronchitics or normal individuals; and moreover very much stronger skin reactions can be obtained with organisms such as the typhoid bacilli, which certainly have nothing to do with the disease. The explanation is rather that the chronic bronchitis acts as an irritable focus, which favours the occurrence of the paroxysms, and is also perhaps responsible for the persistent dyspnœa and other pulmonary phenomena which may remain between the attacks. On this account vaccine treatment is of value only in asthma complicated by bronchitis, and the patient remains a potential asthmatic even though the respiratory infection becomes quiescent. The respiratory flora of asthma is identical with that of chronic bronchitis, and is remarkably constant even though the condition is improved by vaccines. In the sputum *Streptococcus hæmolyticus* and *viridans* and pseudo-meningococci predominate; in the nasal secretions the staphylococcus is the chief organism. It is essential that the sputum should be obtained fresh during or just after a paroxysm, and it is best for it to be expectorated in a sterile Petri dish at the laboratory itself. Details are given of the mode of preparation of the vaccines and the frequency and size of the doses, which are injected intradermally. Of the author's small series of patients two-thirds were much improved. The writing throughout is so modest and disarming that many readers will doubtless be inspired with fresh enthusiasm for the vaccine treatment of asthma, in spite of a lurking suspicion that the therapeutic action of vaccines in any bacterial infection still awaits a convincing demonstration.

Recent Advances in Diseases of Children

Third edition. By WILFRED J. PEARSON, D.S.O., M.C., D.M., F.R.C.P., Physician in Charge of Children's Department, University College Hospital; Physician to the Hospital for Sick Children, Great Ormond-street; and W. G. WYLLIE, M.D., F.R.C.P., Physician to Out-patients, Hospital for Sick Children, Great Ormond-street; Physician to the Hospital for Epilepsy and Paralysis, Maida Vale. London: J. and A. Churchill Ltd. 1935. Pp. 566. 15*s*.

THE series to which this volume belongs is one which has led us to expect a high standard of scholarship and a comprehensive review of the most recent work on the subject dealt with. Pædiatrics is perhaps a rather wide field for satisfactory survey in a book of this compass, but in comparison with its fellows this work is somewhat disappointing. A great deal of matter has been included which is too elementary and at the same time too irrelevant to justify the title "recent advances." Whilst any progress in medicine is admittedly based on a sound knowledge of physiology, this hardly appears the place for a rather tedious and not very original recapitulation of elementary biochemical principles. Similarly, some at least of the clinical descriptions, though unimpeachable, might equally well have been written in 1900 as in 1935. It is only fair to say, however, that the authors would admit this freely; their aim has been to give "a connected outline of the diseases of childhood, emphasising modern conceptions of pathogenesis and recent advances in treatment." Its appearance in a third edition, which has been considerably revised, particularly the chapters dealing with diabetes and immunisation, shows that there is a considerable demand for a book of this character, and if too scientific an approach is not expected, the reader will find much of interest in it. The chapters dealing with the diseases of the chest and of the nervous system seem to us the most useful. Some of the statements made with regard to diathesis

of various types are based on rather nebulous data and will hardly find general acceptance. The production of the volume is uniformly excellent, and the publishers are particularly to be congratulated on the large number of radiograms they have been able to include.

Infections of the Urinary Tract

By T. E. HAMMOND, F.R.C.S., Surgeon to the Royal Infirmary, Cardiff; Consulting Urologist, the Welsh National Memorial Association. London: H. K. Lewis and Co., Ltd. 1935. Pp. 250. 10*s.* 6*d.*

A LARGE portion of this book is devoted to an exposition of the author's views on the nature of infection, in an attempt to correlate infections of the urinary tract with those occurring elsewhere in the body. Mr. Hammond believes that the type of disease occurring in any individual depends as much on the constitution of that individual as on the nature of the infecting organism. He recognises two main classes of abnormal constitution, the hypersthenic and the hyposthenic. The former reacts vigorously to infection, being liable to staphylococcal disease; the latter is said to be more subject to infection with *B. coli*, with a tendency to a poor reaction and chronicity. Stress is laid upon the reactions of the individual to therapy as well as to infection. The author claims that the drugs used as urinary antiseptics act not on the invading organisms but on the tissues of the patient, stimulating their defence mechanisms. Hexamine and the ketogenic diet are thus both believed to exert their favourable effect by direct action on the cells of the central nervous system. The descriptions of the various forms of infection of the urinary tract are clearly the result of a wide experience in urology, and the theories propounded in this book, though unorthodox, are the outcome of much thought devoted to the problems of infection.

Lactobacillus Acidophilus

Its Therapeutic Application. By LEO. F. RETTGER, Ph.D., LL.D., Professor of Bacteriology in Yale University; MAURICE N. LEVY, M.D., LOUIS WEINSTEIN, Ph.D., and JAMES E. WEISS, Ph.D., Research Fellows in Yale University. New Haven: Yale University Press. London: Humphrey Milford, Oxford University Press. 1935. Pp. 203. 11*s.* 6*d.*

THOSE who are specially interested in sour milk therapy will welcome this book. It begins with a series of chapters dealing with the various types of lacto-bacilli and the influence of temperature and other important factors on the growth of the organism. The authors make quite clear the extreme difficulty of isolating the various members of the group, and indicate many points on which precision is impossible even to-day. They are also at pains to show how easily the viability of acidophilus milk can be affected by various adverse influences and how often therapeutic results may disappoint owing to a diluted or delicate strain being employed. It is to be noted that they consider a quart daily of a highly viable acidophilus milk to be the necessary minimum dosage if good results are to be obtained. About the type of case which is likely to benefit from sour milk therapy the authors are rather vague, but apart from somewhat ambiguous conditions such as chronic intestinal stasis they appear to consider that it is in mucous colitis and non-specific ulcerative colitis that the most promising results are secured; 75 per cent. of cases of mucous colitis improved notably but the symptoms appear to have returned in all of them as soon as the milk treatment was discontinued. Less unsatisfactory results were obtained in chronic ulcerative cases; in seven out of eight of such cases the diarrhœa, mucus, blood, and pus disappeared, and although constipation followed cessation of the treatment there was no return of the more alarming symptoms.

We confess that admiration of the fairness and detailed work of the authors of this volume is tempered by disappointment at the very modest claims which they are able to make for a remedy which has interested the public and the profession now for a great number of years.

Manual of Medicine

Fourth edition. By Sir STANLEY WOODWARK, C.M.G., M.D., F.R.C.P., Physician and Lecturer on Medicine, Westminster Hospital; Senior Physician to the Royal Waterloo Hospital. London: Humphrey Milford, Oxford University Press. 1935. Pp. 619. 15*s.*

THIS book is intermediate in size between a text-book and a synopsis, and its style varies from a clipped prose to frank notes and enumerative lists. It doubtless serves a very useful purpose, purveying information to the student whose time is short or who lacks the capacity for making his own notes from a larger text-book. When so much material of varying importance is compressed into so small a space, the perspective is distorted and a proper and graded distribution of emphasis becomes impossible. This is particularly noticeable when treatment is being described. Apart from this limitation, imposed by its nature, the book follows fairly well the lines of accepted teaching, and has been brought up to date. Surprises, however, are not difficult to find, such as the statement that chronic gastric ulcer is commonest in males between 30 and 60 and that alcoholism probably plays a part in its causation, and the further remark that it is "almost invariably" situated at the pylorus. There are a few simple and useful illustrations, chiefly neurological, and a section on insanity is included.

Play in Childhood

By MARGARET LOWENFELD, M.R.C.S., L.R.C.P., Co-Director, Institute of Child Psychology. London: Victor Gollancz Ltd. 1935. Pp. 345. 8*s.* 6*d.*

THE approach to child psychology—normal and abnormal—has till recently been a twofold one. On the one hand there have been the laboratory researches into intelligence by tests, and close observational work of the child mind in action. The classification of clinical disabilities has been unproductive, but psychopathology has opened a new horizon in that it stressed the infantile origin of neurosis and the phantasy life of the child. It was soon seen that while psycho-analysis would reveal mental mechanisms in adults by free association, similar mechanism in children could only be revealed by free play activity in which phantasy was in operation and through which the child played out its experiences and its attitude to its environment. While admitting that the play technique had its true origin in the work

of such analysts as Hug Hellmutt, Anna Freud, and Melanie Klein, Dr. Lowenfeld has worked out a technique of her own, and this volume attempts to give an account of the method and of its findings. The volume is very liberally illustrated with case material and shows the author's enthusiasm and faithful clinical approach. The fascinating "worlds" that children erect in their sand trays are described and interpreted, and the author for the sake of clarity has described the child's activities with phantasy play, and play as repetition of experience, as realisation of environment, and as preparation for life. Those who have similar experience of child play in normal and abnormal subjects will be at one time astonished at the author's daring and at another amazed at her reserve in not going deeper into some of the reactions she records. The analysts will itch to make further interpretations, and the laboratory type of observer will shrink from some of her deductions. But the book is sufficiently documented to reward careful study, even by those who will feel that the author falls between two stools.

1. Patient and Doctor

By Sir HENRY B. BRACKENBURY, M.D., LL.D., M.R.C.S., Vice-President (late Chairman of Council), British Medical Association, &c. London: Hodder and Stoughton. 1935. Pp. 280. 5s.

2. The Doctor and the Public

By JAMES PETER WARBASSE, M.D. New York: Paul B. Hoeber, Inc. 1935. Pp. 572. $5.

1. HERE are two books dealing with the relationship between patient and doctor. Sir Henry Brackenbury begins by tracing the development of medicine through its three phases, the magical, the rational, and the scientific. He discusses the present outlook of medicine which, in addition to its previous two aspects, the curative and preventive, has now added to itself a third, namely, the constructive or perfective aspect. There follows a useful chapter on what the doctor and patient may reasonably expect of one another and the importance of mutual confidence and coöperation to defeat a common enemy is emphasised. The relation between the State and the doctor is next considered. In this chapter the organisation of the medical profession, the essentials of a medical service, and the present systems of State medical provision are described and evaluated. The author regards as inevitable the increasing intrusion of the State into medicine. "The greater concern of the community not only with its own collective health, but also with the personal health of all the individuals who compose it, is not a matter to grumble about but to welcome." The general practitioner must take his share of the increasing (and, may we add, often uninteresting ?) work of preventive medicine. A chapter is devoted to the work of the various kinds of hospitals, their medical staffing, and their relation with the profession outside. Some simple and admirable measures for increasing the comfort of hospital in-patients are suggested. There is a chapter on trained helpers and unscientific healers. Sir Henry Brackenbury has nothing very new to say about the latter, but perhaps does not allow duly for the chief reason that they exist at all, which must be not so much a primitive human craving for magic and mysticism as the all too frequent lack of therapeutic satisfaction obtainable even now from orthodox medicine. If our therapeutics were more effective, surely the raison d'être of the unscientific healer would disappear. The last two chapters deal with the training of a doctor and the future of medicine. No fault can be found with the type of doctor the author wishes to produce. The worst that could be said of the young man who possesses "previous equipment, assiduity and character," would be that he might prove to be a dull dog. Might not a certain liveliness and even humour be added with advantage to counterbalance his more solid qualities ? Visualising the medicine of the future as a social service, the author pictures the general practitioner as one of a team, preferably its captain, ministering to the requirements of the patient, who is not only a biological organism but also a human personality and a unit in a social system.

This book is everywhere interesting and clearly written. On controversial matters the author has been at pains throughout to put the whole case with scrupulous fairness before giving his own views.

2. Dr. Warbasse's approach to the subject is rather different. He is primarily concerned with the historical development of modern medicine and the status of the physician. Starting from the origin of medicine as manifested in animal behaviour, he traces its course through the age of magic to the age of science which began in Ancient Greece. He describes how medical science was kept alive by a few thinkers in the Middle Ages, and the steady advances it made during the sixteenth and seventeenth centuries. Medical progress in the eighteenth century was hindered by the growth of fads and cults, but, in the nineteenth, a scientific age developed a medical culture. Turning to the present, Dr. Warbasse has something to say on the difficulties of maintaining a high code of medical ethic in a competitive world. In his view the doctor must be rendered financially secure if he is to give his best service to the community. Pleading for more doctors, Dr. Warbasse raises once again the vexed question of the periodic medical overhaul by means of which earlier diagnosis of serious disease is to be attained with better prospect of ultimate arrest or cure. Against this might be argued the risk of increasing anxiety neuroses in a world already too full of fear of disease. As every practitioner knows, much professional time is already spent in trying to reassure cancerophobic patients, and one is tempted to wonder whether the sufferer from an incurable disease such as chronic nephritis might not be happier if it were not discovered at an early stage. Dr. Warbasse's book is written in the ingenuous, almost "popular," manner of many similar ones coming from the United States.

Manuel de sérologie pratique

By ÉDOUARD PEYRE. Paris: Librairie Félix Alcan. 1935. Pp. 271. Fr.20.

THIS little book gives an account of the usual serological methods employed in the laboratory. It includes not only immunological procedures, but also such chemical methods as the estimation of sugar, cholesterol, chlorides, calcium, &c., in the blood. A short account is given of the refractometer as a means of studying serum. On the other hand, it omits phosphatase determination, sedimentation-rate, and methods of examining the cerebro-spinal fluid. The descriptions of the methods are easy to follow, but they are not always those which would be used in this country.

THE LANCET

LONDON: SATURDAY, SEPTEMBER 28, 1935

PLASTER-OF-PARIS

"IT were good that men in their innovations would follow the example of time itself," says BACON, "which indeed innovateth greatly, but quietly and by degrees scarce to be perceived." Advance in most things human is however so gradual a process that change is upon us before we realise that it has taken place. Surgical advance is no exception. Mr. PRIDIE's articles on plaster technique, which appear in this and last week's issues of THE LANCET, draw attention to one such development which has within the last five years altered the whole face of fracture treatment. It is hardly too much to say that plaster-of-Paris, in one form or another, has to-day superseded all other fixation splints, be they of wood or metal, and that the modern surgeon employs two types of apparatus only—plaster splints, and skeleton splints for use with weight traction. The methods which Mr. PRIDIE describes are the outcome of the experience of the orthopædic department of the Bristol Royal Infirmary, and have been standardised for that institution. They differ in detail only from those which are now in common use in every organised fracture clinic in the United Kingdom.

Plaster-of-Paris provides not only the cheapest but the most efficient method of external splinting. It requires neither a large stock nor an elaborate variety of apparatus, for by its employment all types of splint can be made, any number of the same kind can be duplicated, or new ones devised for every conceivable purpose. There is no storage problem, for splints are made when required, and thrown away when no longer needed. A well-made plaster splint is stronger, lighter, and more comfortable than one constructed of any other material. But its chief recommendation is its incomparable efficiency as a means for controlling the position of the limb which it encloses. For a plaster splint is an individual thing, fitting the part upon which it is moulded in every detail. Stock splints of wood or metal, however great their variety, can never be more than an approximate fit. Long bones are curved, splints are straight. Limbs vary infinitely in length, diameter, and contour, and in the relative proportions of their segments; splints can only be graded to a finite extent, and permit of a limited variation in the position of the joints adjacent to the injured segment. To make it fit and keep it comfortable a stock splint must be padded, and padding means the employment of a yielding structure which is incompatible with complete control. The well-designed plaster splint maintains position by its perfect adaptation to the limb, and not by pressure or traction. The reasons for the pre-eminent position of plaster-of-Paris to-day require no elaboration, but it is interesting to speculate why the method, which was old 4000 years before Christ, and which was apparently known to the surgeons of antiquity, should only have attained full recognition during the last five years. Why are fixed splints still made and sold; why are new ones devised from time to time; why is plaster-of-Paris still so little used outside the hospitals and fracture clinics? Many factors have undoubtedly contributed to this tardy recognition. Plaster-of-Paris, as is well known, must be blended with some fibrous material to be efficient as a splinting medium, much as concrete is reinforced with a core of metal strips. The older methods of plaster work made use of felt or house flannel for this purpose; accurate moulding was difficult and failures frequent. Perfection in method has come with the development of the plaster bandage, that protean unit that can be used in so many ways. But while good plaster work has been made very much easier by improvements in materials, it still remains an exacting art, demanding not only some experience and natural aptitude, but space, time, and skilled assistance. Lacking these last three, the busy worker is often obliged to use ready made splints in spite of their disadvantages. First-aid work and temporary immobilisation will always demand some readily applied apparatus.

The perfect plaster splint must retain the limb under all conditions in the desired position with complete comfort. It must be strong yet light, effective in use but easily removed when it is no longer required. It must therefore be planned upon engineering lines. The greater part of it is a retentive shell, which need only be thick enough to withstand chance blows, but it must be reinforced at its edges and buttressed where it is subjected to special stresses. Places that are too thin will weaken the whole; unnecessary thickness means unnecessary weight. Not only must it be well designed but it must be homogeneous, plaster and gauze being uniformly incorporated throughout, so that no trace is seen in section of its component layers. If part of the bandage is applied too dry, it will not set; if moistened too early, it will set prematurely and fracture on application. If one layer is set before the next is applied, or if successive layers are not well rubbed in, air spaces will appear and strength will be lost. The perfect plaster splint requires not only perfect technique but a perfect bandage. Every orthopædic surgeon is well aware that the making of such bandages is in itself an expert's job. The plaster-of-Paris must be of the finest quality, freshly prepared, and kept air-tight. The muslin must be fine enough to retain the powder, yet not so fine as to hinder the permeation of water. The powder must be rubbed in slowly by hand, not too much and not too little, and no lumps must be incorporated. The bandages must be rolled so loosely that they will take up water at once. When made they must be stored in air-tight tins,

and those tins must not be disturbed till the bandages are required, or the powder will shake out and accumulate in the bottom of the tins. The making of these bandages is a laborious, but highly skilled task, and it will often happen that, when a nurse who has been doing the work has been moved to a new post, the fracture work of a hospital may suffer for a whole month till her successor has acquired the necessary skill. One great advance, which has made uniformly good work possible to those who have the patience to learn the technique, is the introduction of the modern proprietary plaster bandage. Ready made bandages have always been obtainable, but these have till lately been inferior to the best of the hand-made ones, the chief fault being that the gauze upon which they were based has been too thick and rigid to permit that accurate moulding to the contour of the limb upon which success depends. The modern bandages have all the advantages of the hand-made article, with others of their own. Their quality is constant, and they keep indefinitely without deterioration. They absorb moisture more rapidly than hand-rolled bandages, and set firmly in less than ten minutes. When set they are stronger yet less brittle than ordinary plaster; the surface is hard polished and non-absorbent, the trimmed edges do not crumble, and casts made from them can be bisected, or cut open and sprung apart, without loss of strength. A splint made with this is thinner, lighter, and more durable than one of equal strength made from the best hand-rolled bandages. Perhaps the most striking advantage to the surgeon is the manner in which the plaster is incorporated with the bandage; this makes the construction of a splint a very much cleaner job, for no powder gets loose on the table and floor, and a more economical one, for small strips and bars can be cut out beforehand, moistened, and laid on at points of stress to reinforce the completed splint.

Plaster-of-Paris technique has culminated in the development of the unpadded plaster case, a method of fixation which we owe to LORENZ BÖHLER of Vienna. The unpadded case is the basis of modern fracture treatment; it is not merely an improved application of an old technique, but the expression of a physiological ideal. To the anatomical mind the aim of fracture treatment is the reconstruction of the bone in its former length, alignment, shape, and structure; to the physiological mind it is the restoration of the injured limb to its former function, taking into consideration not only the bone, but the joints, muscles, circulation, and innervation of the damaged segment—and the mentality of the patient. The ideals of form and function have been at variance throughout the ages; form has asked for splinting, fixation for movement. Many of us have seen the evil results of prolonged or excessive fixation, but only those older surgeons who are familiar with the results obtained by LUCAS-CHAMPIONNIÈRE and his disciples are aware of the ghastly failures for which the early movement school has been responsible. Movement of repair tissue leads to injury, injury calls forth hyperæmia, and hyperæmia in turn brings decalcification and deficient bone formation; on the other hand, complete rest leads to a decreased circulation, stiff muscles and joints, and the formation of avascular and sclerosed bone. It has remained for BÖHLER to point out the ideal, which is use of the injured part without movement of the injured structure. By such means the circulation is maintained at its normal level, neither deficient nor excessive, bone repair proceeds at its optimum rate, while the muscles and joints maintain their circulation and retain their movements. This ideal can only be reached by the use of a plaster case, accurately fitted to the surface of the limb and the contour of its bony points, which combines complete immobilisation with entire comfort. But the unpadded case is only successful if it is faultlessly applied; the chief danger is constriction of the limb, the commonest cause of failure the development of pressure sores due to wrinkles on its inner surface. Such sequelæ are usually due to some error, such as the attempt to alter the position of the limb after the case has been put on, and they will be avoided by careful study of Mr. PRIDIE'S instructions.

The immensely improved results which are being obtained to-day in Colles's fracture and fractures of the tibia and fibula by this method of functional use of an immobilised segment are known widely enough to need no eulogy. Böhlerism has come to stay. Plaster-of-Paris reigns supreme.

THE PASSING OF OTORRHŒA

THE frequency of discharging ears is not a bad index of the efficiency of medical care in any community. Some twenty years ago a mother brought one of her children to an out-patient department in a poor district of London complaining that, although the child was teething, there was no discharge from the ears, as had been the case with all her other children. Otorrhœa was in fact appallingly frequent before the medical inspection of school-children was instituted in London thirty years ago, and indeed until an efficient organisation for the treatment of these cases was gradually evolved some ten years later. But only a few of these cases attended hospital and then very irregularly; in the intervals the children were left to the care of their mothers, who were quite incapable of keeping the ears in a wholesome condition. Most of them were in consequence in a very offensive state, and the smell of an elementary class-room was often disgusting; no one who has not experienced it can imagine what it was like. And yet chronic discharge from the ears is preventable. If treated correctly from the beginning, the majority of cases of acute suppuration heal with intact drum and restoration of function; while most of those that persist can be cured by timely operation on the mastoid.

In London the campaign against otorrhœa began with the organised treatment in the schools under the control of the London County Council, the story of which is told in the school medical

officer's report[1] for 1934. About 1909 district nurses were first employed to visit affected children in their homes. Although the ears were thus kept in a more hygienic condition, the method was not satisfactory; the cost per case was considerable, the nurse wasted much time in visiting a home often to find that the child was out, and the work was not under medical direction. Four years later "minor ailment departments" were introduced at school treatment centres, where the district nurses worked under medical supervision; these have been gradually increased in number until there are now 70 covering the whole of London; this led to a great improvement in the conditions, and got rid of the offensive ears altogether. The doctors in charge were not, however, specialists in otology, and the departments tended to be clogged by uncured cases. An "ear inspection clinic" was then arranged, to which were referred cases from the surrounding minor ailment departments. In-patient treatment was also secured for those whose cure could only be expected from mastoid operation or other in-patient treatment. This clinic proved to have great possibilities and the system was gradually extended to other areas; an aural surgeon of experience was appointed to each, and in 1920 zinc ionisation was added to the routine of treatment. At first cases from the minor ailment departments which did not clear up after three months' treatment were sent to the special clinics, but in 1925 it was arranged that all cases which had not recovered in one month should be so referred. This is a point of the utmost importance for it enables the children to receive expert attention at the most critical period of the disease. In the early years treatment by operation was greatly hampered by the long wait for hospital beds, but this difficulty was surmounted by the provision of adequate accommodation by the Metropolitan Asylum Board, and more lately at the L.C.C. special hospitals. Children on leaving hospital now receive after-care at a special centre.

Figures given in the report show the success of this work in reducing the frequency of otorrhœa; thus in the period since 1911, covering the twenty-five years of His Majesty's reign, the percentage of children suffering from discharging ears has fallen from 3·7 to 0·9. Nevertheless in the year 1934, 4200 discharging ears were observed, of which 2261, or 53·8 per cent., were cured; 1271 of these were old cases returning for observation, showing that relapses are still occurring. These figures relate to ears, not patients, the proportion of cases cured being 70 per cent. or more. Despite this enormous improvement much remains to be done; there is still far too much otorrhœa among the children of our county schools. The best prospect of further improvement probably lies in paying greater attention to acute otitis in its earliest stage. Since the child with earache is kept away from school, the chief hope of progress is to be found in enlisting the interest of the family doctor and in educating the public in the importance of early treatment.

[1] L.C.C. Annual Report for 1934, vol. iii., part 2.

FORCEPS HEAVY AND LIGHT

THAT obstetricians do not practise what they preach is the conclusion drawn by Mr. WRIGLEY from the study of the case records of "one of the leading maternity homes in London" (see p. 702), a study presumably undertaken in order to confirm or refute an impression gained from other less definite evidence. The patients in the nursing-home to whose records he had access were for the most part under the care of teachers of obstetrics. Mr. WRIGLEY has ascertained that delivery was completed by forceps in as many as 203 of the last 300 consecutive cases (primiparæ) admitted. On their face value these figures certainly support his thesis that it is likely to be more profitable to find some way of reducing the risks associated with the application of forceps than to attempt to stop their use. He contends that the powerful but dangerous instrument now in vogue was designed and constructed to enable the accoucheur to deal with a woman "whose pregnancy had had no supervision and in whom obstructed labour had occurred, the fœtal head having failed to descend in the pelvis." And we agree with him that to-day such disproportion would stand a far better chance of being discovered either during pregnancy or early in labour, when Cæsarean section rather than forcible delivery would be performed. Nowadays delay in labour, when it occurs with the head at the pelvic brim or in the mid-pelvis, results generally, as Mr. WRIGLEY says, from incomplete rotation or flexion or a posterior occiput; in such cases the proper course is anæsthetisation of the patient, and a thorough examination to ascertain the cause of the delay, possibly followed by Cæsarean section, rather than hasty application of forceps long enough to reach and grasp the fœtal head and strong enough to haul it out. Reiteration of the potential dangers of such an instrument is, in Mr. WRIGLEY'S view, futile so long as the medical student sees it in the hands of house officers for routine forceps delivery of fœtal heads low in the pelvis. His solution is the substitution of a short light forceps for the axis-traction model, being convinced from personal experience, detailed below, that it will meet most of the needs of the doctor and will enable him to shorten labour without risk to mother or child.

In the last 58 consecutive deliveries of primiparæ in his own practice the fœtus presented the vertex. In 23 of them delivery was unaided; in 32 the head was lifted through the pelvic floor with a short forceps weighing less than 10 oz. In 2 of 3 cases where manual rotation of a persistent occipito-posterior position was required the fœtus was delivered easily with the light forceps. In the third the fœtal head did not sink into the pelvic cavity after rotation and the long forceps was applied. Mr. WRIGLEY admits that the 32 women would eventually have delivered themselves; his principle in expediting labour is the humane one that it is the duty of the attendant to alleviate pain in so far as this is possible without

prejudicing the life or well-being of mother or child. In this short series all the infants were delivered alive and well, with the exception of one fœtus which had no bone formation in the vault of the skull. There was no maternal morbidity and the incidence of laceration of the perineum was slightly less in those women whose delivery had been assisted by forceps. It has of course yet to be proved that these forceps are as harmless in the hands of the general practitioner as in those of an expert. The tendency of modern operative technique is to use mechanically efficient instruments, which the operator can control with little muscular exertion of his own. It might be argued also that a short light forceps would be of little use in expediting a case of tedious labour with early rupture of the membranes, slow dilatation, a large caput, and marked moulding. The caput may show but the skull may be still far from the perineum, held up perhaps by the ischial spines. These are the cases where forceps are really required, and where longer ones are, if not essential, certainly more conveniently applied.

The orthodox obstetrician will doubtless find much to say in his own defence. He may suggest that the practice in the particular home selected represents that not of the best but of the most fashionable obstetricians, and that these achieve and maintain their popularity by pandering to their clients' desire for a speedy and relatively painless delivery rather than one which offers the utmost degree of safety to mother and child. It may be said, too, that if London practice is mirrored by that in this particular home it falls short in excellence of that at other centres. But when all has been said in defence there will remain an uneasy feeling that there is a good deal of truth in the suggestion that forceps are used and probably will always continue to be used in order to expedite the final stages of a normal delivery. The expert obstetrician is not likely to be tempted to use a more powerful instrument at an earlier stage just because he has it in his bag. But the practitioner may well learn to have a far greater respect for the axis-traction forceps if the veto which forbids him to use it except in grave emergency is accompanied by permission to help the weary patient to complete her labour with an instrument which is adapted for that purpose only.

ANNOTATIONS

INFANT MORTALITY ONE HUNDRED YEARS AGO

THE absence of the systematic registration of births and deaths makes it difficult in this country to trace at all accurately the course of mortality before the founding of the General Register Office in 1837. The figures upon which most workers have relied have been those contained in the London Bills of Mortality. In New York the difficulties appear, according to a recent paper by Charles Bolduan and Louis Weiner,[1] to be equally acute and to have lasted to a much later date; the registration of births was not established there until 1853, and even then for many decades was notoriously incomplete. In computing the infant mortality-rates of the nineteenth century these authors have therefore had to make an estimate of the births at each point of time from the populations recorded at ages under five at the census enumerations, or to work from conjectured birth-rates in each decade.

The result of their calculations is somewhat surprising. During the early part of the nineteenth century they find that the infant mortality-rate was relatively low—about 120 to 140 per 1000. It then rose steadily to a maximum of about 230 during the 'sixties, since when there has been a continuous and steep decline to a rate of about 60 in recent years. The unexpectedly favourable rates of the beginning of the century might be due to incompleteness in the reported deaths, and the subsequent rise to an improvement in their registration. But satisfaction on that point needs local knowledge, and Bolduan and Weiner from their inquiries are satisfied that the prevalence of low rates during the earlier years must be accepted as a fact, although the actual figures can, of course, be regarded as only approximately correct. The local situation also supports, they suggest, the validity of the picture. In the first quarter of the nineteenth century manufacturing was relatively unimportant in New York, whose inhabitants were mainly devoted to trade and shipping, housing conditions were generally favourable, and immigration from overseas was not yet well under way. The second quarter brought profound changes. The growth of population accelerated, factories increased, the standard of living fell through the competition of the increasing immigrants, and overcrowding and insanitary housing became prevalent. These conditions lasted through the 'fifties and 'sixties and led to the foundation of the present Department of Health with its subsequent improvement in the environmental conditions of the city and in its mortality experience. Such changes in conditions make it reasonable, the authors suggest, to accept their conclusion from the statistics that the infant mortality-rate was no higher at the beginning of the nineteenth century than at its end. That conclusion would in all probability be true of London, but the changes in level throughout the hundred years shown by Bolduan and Weiner in New York were certainly not present in London. Apart from spasmodic fluctuations from year to year the rate showed very little movement. From 1841 to 1901 it lay fairly steadily between 150 and 170 per 1000, and Brownlee's study [2] of the Bills of Mortality suggests that it was very little higher (about 180 per 1000) at the end of the eighteenth century. During that century there seems little doubt that child mortality, and probably infant mortality, fell heavily. Brownlee's figures for the death-rate under two show a rate in 1791–1800 only, roughly, half that calculated for in 1731–40, while J. R. Edmonds, an early contributor to our columns,[3] reached the conclusion that the death-rate under five was in 1810–30 less than half its level in 1730–50.

The London and New York figures, therefore, show very little likeness to one another. The London infant mortality-rate was probably improving in the eighteenth century, showed very little change through-

[1] Jour. of Pediatrics, July, 1935, p. 55.

[2] Proc. Roy. Soc. Med., Sect. of Epidem., 1925.
[3] THE LANCET, 1835–36, i., 690.

out the nineteenth, and began its precipitate decline, in common with the rest of the country, at the turn of the twentieth. The New York experience, on the other hand, shows in Bolduan and Weiner's figures a material worsening throughout the first half of the nineteenth century, followed by an unbroken improvement from 1870 onwards—a generation before the corresponding movement in London.

TONSILLECTOMY

TONSILLECTOMY should now have been fashionable long enough for some agreement on its value to be reached. Dr. A. D. Kaiser, chief pediatrician to the Rochester General Hospital, New York, who has estimated that half the older children in the large American cities have had their tonsils out, found [1] that in a well-controlled group of over 2000 children whose tonsils had been removed, there did appear to be a slightly diminished incidence of scarlet fever and diphtheria, although there was an increased susceptibility to sinusitis, bronchitis, and pneumonia. Ulf Nordwall,[2] working at the Stockholm Hospital for Infectious Diseases, investigated the severity and complications of scarlet fever and diphtheria in groups of tonsillectomised and non-tonsillectomised children. For this purpose he classified his cases of scarlet fever into groups according to the extent and severity of the rash and the angina, and also according to the occurrence, number, and type of complications. He also made the wise provision of separating those cases in which extirpation of the tonsils was complete from those in which tonsillar remnants remained. From a total number of 104 tonsillectomised cases and 312 non-tonsillectomised controls, he concluded that not only had tonsillectomy failed to influence the severity of the onset as judged by the angina and the eruption, but also that there was no demonstrable influence on the complications with the possible exception of sinusitis, which appeared to be somewhat more frequent in the tonsillectomised patients. The figures relating to diphtheria had to be drawn from a smaller number of tonsillectomised patients, since most of the cases admitted to hospital suffering from diphtheria had intact tonsils. Over a six-year period, it was only possible to be certain of 71 tonsillectomised patients in a total of 1781 diphtheria admissions; these were compared with three times as many controls. The cases were divided into four groups, consisting of those with (1) mild reddening with or without small membranes on the tonsils; (2) more extensive membranes localised exclusively to the tonsils; (3) membranes extending beyond the tonsils but not covering extensive areas of the pharynx, and with some sign of virulence; and (4) signs of virulence and membranes covering large parts of the mouth and throat. Groups (1) and (2) were regarded as benign, (3) and (4) as malignant. The results showed that diphtheria of the pharynx was considerably more frequent amongst patients with tonsils than amongst those without, whereas nasal diphtheria was commoner amongst the latter; and that both malignant diphtheria and complications occurred much more often in the non-tonsillectomised cases. It would be curious if tonsillectomy proved to be more useful in the prevention and attenuation of diphtheria than in the prevention of the onset of complications of scarlet fever or rheumatism. With regard to the latter, Kaiser, in a recent summary [3] of the important points in the control of rheumatic disease in childhood, recording conclusions reached from a detailed study of 1200 rheumatic children, does not get us much further. All he can say from his material is that removal of the tonsils in children subject to attacks of tonsillitis or muscular pains will protect some children against the severe types of arthritis which have the highest mortality-rate in this disease. The figures available in this country [4] appear to support the American statistics. Although tonsillectomy is not as widely practised amongst the poorer classes, over 50 per cent. of public school boys have had their tonsils removed. The incidence of respiratory infections, sinusitis, and even catarrhal conditions appears to be, if anything, slightly higher amongst those who have been tonsillectomised than those who have not. In face of such evidence, there does appear to be a real need to temper the general optimism with which the operation is apt to be recommended.

[1] Children's Tonsils In or Out. London. 1932.
[2] Acta Pædiatrica, 1934, xv., 338.
[3] Bull. Trimestriel of the International Association for Preventive Pediatrics, 1935, ii., 13.

BALANITIS

INFLAMMATORY conditions of the glans penis are often met with in practice, but medical text-books give little space to their description and not much help in distinguishing one form from another. In a recent review [5] Dr. John F. Madden enumerates various direct causes—namely, phimosis, congenital and acquired, trauma, chemicals, and non-specific bacteria. Erosive balanitis, which may lead on to gangrene and phagedena, has been shown to be caused by Vincent's spirochætes in symbiotic relationship with fusiform bacilli under anaerobic conditions. Favourable conditions for its production are the combination of a long tight prepuce with faulty hygiene. The disease is known to be inoculable from patient to patient, and for this reason it has been termed by Corbus and others "the fourth venereal disease." Dr. Madden takes the view that under suitable local conditions with lowered general resistance the disease may be produced by organisms normally present as saprophytes; it is therefore not necessarily venereal in origin. Balanitis due to the gonococcus without concomitant urethritis has been described, but must be very rare. Of the forms of balanitis occurring in the course of exanthematic diseases that associated with the early stages of syphilis is the most important. It is always imperative to exclude primary syphilis when balanitis is associated with phimosis. Cases have been recorded in which the primary stage has taken the form of a specific balanitis without demonstrable localised primary lesion, the so-called syphilis d'emblée. Balanitis associated with multiple pin-head erosions throughout the preputial sac may form the primary manifestation. Balanitis may also occur as part of the secondary stage of syphilis, especially as the result of extension to the glans penis and prepuce of a macular roseolar rash. The diagnosis of these conditions can usually be confirmed by microscopic demonstration of the *Spirochæta pallida* with dark-ground illumination, and this examination should never be omitted. Scabies, erythema multiforme, and various generalised eruptions due to internal medication are occasional causes of balanitis which fall into this group. Balanitis sometimes results from metabolic disorders, particularly diabetes mellitus; Dr. Madden states that some degree of balanitis is present in about 7 per cent. of all male diabetics. Retention of the sugar-laden urine in the preputial sac gives rise to a secondary mycotic inflammatory

[4] Glover, J. A.: Post-Grad. Med. Jour., 1934, x., 12.
[5] Jour. Amer. Med. Assoc., 1935, cv., 420.

eruption. From the fact that this may be the first external indication of glycosuria, the importance of testing the urine for sugar in all cases of doubtful origin will be obvious. Other causes included in this group are the excretion of large amounts of phosphates, creatinine or urates in the urine, and ammoniacal fermentation due to incontinence or other cause. Certain local tissue changes may also give rise to balanitis. These conditions, which include kraurosis penis and leucoplakia penis, are relatively uncommon, but are important from the fact that they are known to be precancerous lesions. They are usually found in older men as the result of some chronic irritation. Dr. Madden describes a rare condition, balanitis xerotica obliterans, found in younger men, sometimes following circumcision for phimosis. Meatal narrowing may occur and complete occlusion of the urethra has been reported.

PLACENTAL EXTRACT IN MEASLES PROPHYLAXIS

THERE is, unfortunately, no reason to suppose that London will fail to experience within the next few months its biennial epidemic of measles, and although the value of convalescent or adult-immune serum in prophylaxis is fully accepted, it is unlikely that during the expected visitation the supply will prove anything like adequate to the demand. The difficulties which beset the collection of convalescent serum in sufficient quantities are obvious and perhaps insurmountable, but it should surely be possible by propaganda and organisation to secure in large numbers suitable donors of adult-immune serum. If, however, a reliable prophylactic were available which could be obtained more easily, the problems of public health departments during a measles epidemic would be greatly simplified. So far, measles-immune sera from other than human sources have not been proved to convey any appreciable protection, and the human donor has been the sole source of supply. Recently, however, the human placenta in its extra-corporeal phase has provided a promising alternative. On the ground of the known immunity of the new-born to the disease, C. H. McKhann and T. F. Chu [1] were the first to use placental extract in measles prophylaxis and, although its merits are not as yet fully attested, placental extract is issued commercially in the United States. The extract is prepared from the placentas of healthy white women with negative Wassermann and Kahn tests; the cord-blood must also show a negative W.R. The placentas are ground up and extracted with saline. The extract, freed from tissue and blood-cells, is precipitated with ammonium sulphate. The precipitate is dissolved in water, dialysed to remove salts, adjusted for protein-nitrogen content, and preserved with phenol. I. M. Levitas [2] has employed this preparation not only for prophylaxis but also for treatment in doses of from 1 to 2 c.cm. injected intramuscularly into the buttock. He records his opinion that the results in 25 out of 28 patients treated were excellent; but the 5 cases of which details are given provide no convincing evidence that placental extract is of any greater value in the *treatment* of measles than are convalescent or adult-immune serum, and these are now discredited as therapeutic agents. The prophylactic results reported by Levitas, however, are comparable with those obtained by innumerable observers with convalescent or adult-immune serum. Attenuation attempted in 18 children exposed in their homes, a much more severe test, as S. Karelitz and B. Schick [3] have pointed out, than exposure in a hospital ward, succeeded in 13 cases. In 2 of the children in whom exposure had been "moderate" only the attack failed to occur at all; in 3 there was failure to secure attenuation, attributed to exceptionally intimate exposure and late injection. In another experiment, 12 children, exposed in a hospital ward, were injected with a view to prevention, and no cases of measles resulted. Although none of the children were ambulatory, the nearest bed to the affected child was only about 3 feet from it, and thus if the neighbouring children were in fact susceptible and not already immune, this meagre allowance of space would seem to have provided ample chances of effective exposure. Placental extract is easy to obtain, and the removal of all save the globulin fraction makes it possible to get an extract effective in small dosage. Levitas injected 2 c.cm. for attenuation (1 c.cm. for an infant) and 3 c.cm. (he suggests 3 to 4 c.cm.) for prevention. But the dosage must clearly be tentative at this stage, since there is as yet no standardisation as ordinarily understood. One commercial product is standardised with diphtheria toxin, but since the antitoxic content of placental extract bears no definite relation to the amount of measles protective substance it does not help us much. Further, as McKhann, Green, and Coady [4] have shown, these two principles occur in varying amount in different parts of the extract. There is however a more important objection to placental extract as at present prepared—its liability to produce reactions, both local and general. These have been attributed in part to the presence in the extract of tissue proteins. The properties of placental extract are at the present time the subject of special investigation in this country, and for the moment most workers would agree with the view of the Council on Pharmacy and Chemistry of the American Medical Association [5] that the product is hardly beyond the experimental stage.

THE CHOICE OF A HEARING AID

THERE is at the present time an extensive sale of apparatus to deaf people, a large part of which is caused by the extravagant claims of unscrupulous purveyors. This has resulted in hearing aids falling into some disrepute, in spite of the attention which has been given to them in medical and scientific circles, and the very great benefit that an appropriate instrument may be to many deaf people, and to their friends. The National Institute for the Deaf has issued a pamphlet for the information of the deaf, entitled "The Choice of a Hearing Aid," with the joint approval of its own medical committee and the physiology of hearing committee of the Medical Research Council. The chief causes of deafness, and the types of instrument at present available, are briefly described in non-technical language, with very practical advice on purchase. The deaf are reminded that the National Institute keeps a list of firms who agree to comply with certain canons of commercial etiquette, and who also allow an extended home trial, if 5 per cent. of the value of the instrument be paid when it is not retained at the end of the period. The deaf are advised to read carefully any agreement before signing it, and are warned against certain widely advertised non-electrical "aids," for which the price asked for home trial exceeds the cost of manufacture. The maximum alleviation of deaf-

[1] Amer. Jour. Dis. Child., 1933, xlv., 475.
[2] Jour. Amer. Med. Assoc., August 17th, 1935, p. 493.
[3] Ibid., 1935, civ., 991; see also THE LANCET, 1935, i., 1164.
[4] Jour. Pediatr., 1935, vi., 603.
[5] Jour. Amer. Med. Assoc., August 17th, 1935, p. 510.

ness can be obtained by the combination of a suitable instrument with good lip-reading. No clinical or experimental evidence has been brought forward to suggest that the continued use of a hearing aid causes any increase in existing deafness; there is thus no scientific basis for a popular fallacy which prevents some deaf people from taking advantage of instrumental help. For the benefit of the deaf, this pamphlet should circulate as widely as the newspapers and books of postage stamps which carry deaf-aid advertisements into the corners of the earth. It can be obtained for threepence from the National Institute for the Deaf, 105, Gower-street, London, W.C.1.

MR. PLOWS

William Henry Plows, a senior clerk in the office of the Examining Board in England of the Royal Colleges of Physicians and Surgeons, died on Monday last at Westminster Hospital after a severe operation at the age of 56. Many of those who have sat for the examinations of the Conjoint Board, or the primary F.R.C.S., will recall the dark short bespectacled figure at the table in the medical clinical room, or standing at the foot of the stairs with the glad news that "you have passed all right." There was, moreover, always a note of real sympathy in his "I am sorry to say that you have failed." Plows was appointed to the clerical staff at the Examination Hall in October, 1895, and would have completed 40 years of loyal and conscientious service next month. To many generations of examiners he will be remembered for his courtesy and imperturbability in all circumstances. Much of the smooth working of the examination system devised by the late Sir Frederic Hallett was due to Plows's grasp of detail and the scrupulous care which characterised all his work.

A DIETETIC LIBERTINE

THE snack bar has become such a popular type of restaurant in recent years that the merits and demerits of frequent rather than heavy meals deserve consideration. H. W. Haggard and L. A. Greenberg [1] have correlated the variation of physical efficiency in factory workers at different periods of the working day with variations in blood-sugar and respiratory quotients, finding that all three are low when work is done after a meagre breakfast or at periods long after a meal. In directing attention to the spacing of meals throughout the 24 hours rather than to the total quantity or quality of foodstuffs consumed they are really suggesting the propriety for normal citizens of a régime long recommended to sufferers from chronic gastric disorders. Dr. Bashford and Dr. Scott suggest (see p. 714) that the part played by irregular meals in the production of peptic ulcer may have been over-rated, but it is easy to believe that the general efficiency of the worker as a machine is promoted by frequent stoking. Dr. Izod Bennett, in a spirited defence of the primitive method of eating to satisfy hunger rather than the peal of the dinner bell, which we print on p. 749, stakes out a claim for freedom to eat what we like when we like. The constant warnings in the last two decades of the dangers of diseases which must follow the increasing artificiality of the people's food have not, he holds, been justified. The manufacturers, of margarine for example, have had little difficulty in adding to their product those missing elements which made it inferior to dairy produce as a food, or in supplying a chemical factor of greater value in the treatment of diseases than a natural factor present in food. It is a salutary reminder from one whose professional work has been largely concerned with the disorders of the alimentary canal and has retained an outlook detached enough to poke fun impartially at the food faddist who seeks a cure for every ill in eccentric dietaries, at the new school of gourmets who revolt against standardised food, and at dietitians brave enough to distil from the cauldron of modern theories the essence of a hospital menu.

[1] Diet and Physical Efficiency. By Howard W. Haggard, M.D., and Leon A. Greenberg, Ph.D., of the department of applied physiology in Yale University. London: Humphrey Milford, Oxford University Press. 1935. Pp. 180. 13s. 6d.

PATIENT AND DOCTOR

WHAT is the essence of a successful personal relationship between patient and doctor? Sir Henry Brackenbury, in a book reviewed elsewhere in this issue, gives the answer as mutual confidence and coöperation. Few, if any, will disagree with him though opinions may differ as to how that ideal is to be attained, and yet some have certainly deplored the passing of the pomp and circumstance which surrounded the Victorian doctor. The air of mystery made him more impressive and convincing to some patients at least. The modern doctor, on the other hand, who plays golf and slices into the rough may lose prestige thereby, it being inferred perhaps that, just as he foozles his drive, so may he foozle his diagnosis. Far better, it is urged, that the doctor should remain a figure somewhat aloof and mysterious with few social contacts outside his work. Every general practitioner encounters patients who are competitive rather than coöperative, with whom a consultation is a sort of viva-voce examination with the doctor as examinee, who delight in "catching him out" in trivial technical errors, and especially in recovering from their disorders after having disregarded his advice. As Sir Henry Brackenbury says, this competitive spirit is probably born of fear, and it is hard to believe that anything is to be gained by preserving an atmosphere of mystery with such patients since, by so doing, the element of fear may be increased. The genuine unstilted friendship subsisting between so many general practitioners and their patients is surely the greatest incentive to mutual confidence and coöperation. The intelligent patient no longer expects his doctor to be mysterious and infallible. What he does expect (and usually gets) is a reasonable amount of skill and care. Dr. Robert Hutchison said recently that the individual doctor is probably better liked than the profession as a whole, and it is, perhaps, fitting that it should be so.

A SPECIAL lecture by Dr. W. B. Coley, of New York, on the treatment of inoperable malignant tumours with the toxins of erysipelas and *Bacillus prodigiosus*, based on a study of end-results from 1893 to 1934, will be delivered at the Royal College of Surgeons of England on Thursday, Oct. 10th, at 5.30 P.M.

BIRMINGHAM CHILDREN'S HOSPITAL.—An innovation among children's hospitals in this country is the erection at this hospital of a special block of buildings for infants under two. The reason given for the separation of sick babies from older children is that infants are particularly liable to contract catarrhal infections. The aim at this hospital is to have a separate room for each infant, each nurse having charge of not more than two infants.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXX.—FOREIGN BODIES IN THE AIR AND UPPER FOOD PASSAGES

WITH few exceptions foreign bodies in the regions under consideration can be removed without injury to the patient and with the prospect of complete cure. The conditions vary greatly with the site of impaction and with the nature of the object.

In the Nose

Children may push pieces of pencil, beads, peas, or other small objects up the nose. There is unilateral obstruction of varying degree associated with rhinitis of increasing severity, leading to suppurative changes. Failure to remove the foreign body results eventually in one-sided blood-stained discharge, sometimes with fœtor, after a period of quiescence. Infection of sinuses may follow, together with signs and symptoms referred to the passage of infected material into the pharynx. Once the object becomes firmly impacted it is not likely to be extruded spontaneously; removal, usually under general anæsthesia, is essential, and will be followed by disappearance of symptoms and signs.

In the Paranasal Sinuses

The most common type of case for discussion under this heading is the result of an unavoidable accident—the slipping of the root of a tooth into the antrum during attempts at removal. Infection of the sinus follows, sometimes acute, but often of a less violent nature. The patient complains of nasal discharge, obstruction, and sometimes fœtor; the cause of the condition is revealed by physical and X ray examination. It is necessary to open the antrum by the canine fossa route, to remove the fragment of tooth, and to make a drainage opening through the inferior meatus of the nose. Treatment of this nature cures the condition, but failure to carry it out leads to all the disabilities and dangers of maxillary sinusitis.

In certain cases pieces of shrapnel, bullets, or the broken end of a cannula are found in the antrum and may cause suppuration. It is, however, possible for an uninfected object to remain quietly in the cavity without causing symptoms.

In the Nasopharynx

The blade of an adenoid curette may break off in the nasopharynx and become impacted there. It will cause inflammatory changes, with subsequent suppuration if not removed, a procedure not fraught with any great difficulty. Vomited material may be projected into the nasopharynx, but is usually ejected spontaneously.

In the Pharynx

Smooth objects do not lodge in this region unless they are of great size, as, for instance, large pieces of meat or fruit. The prognosis in such an instance is extremely bad, as the aperture of the larynx may become obstructed, and attempts at removal with a finger may only serve to push the obstructing object further down. If asphyxia is impending immediate laryngotomy is required to save life, followed by removal of the foreign body under vision.

Small objects of a sharp nature such as bristles, fish or meat bones, pins or needles, may become stuck in a tonsil, in the vallecula, or in the pyriform fossa. In the two first-named positions considerable discomfort is produced, with pain on swallowing; there is seldom danger to life or even severe illness. In the pyriform fossa the position is more serious as perforation of the pharyngeal wall may result. Such an accident is of great danger, as it leads to surgical emphysema and cellulitis, possibly tracking down into the mediastinum, and associated in bad cases with erosion of blood-vessels and even of the common carotid artery.

Irritation of the outer aspect of the larynx leads rapidly to marked swelling of the lax connective tissue of the aryteno-epiglottic folds. Stridor and slight dyspnœa may result, but seldom to a degree sufficient to call for tracheotomy. Suppuration at the site of impaction may, however, lead to the inspiration of infected material, causing septic bronchitis or bronchopneumonia.

In every case the foreign body must be removed with forceps under vision afforded by the use of a tongue depressor, or a laryngeal mirror, or else through a direct laryngoscope. Unless perforation has already occurred all symptoms and signs should disappear rapidly. If the pharyngeal wall is perforated, with resulting external signs, incision through the skin is required. If carried out early and thoroughly this operation should save the patient's life, except in the rare cases where a large artery has been eroded. The seriousness of the complications make it imperative to take careful notice of the patient's complaints and to act with the requisite expedition and thoroughness.

Sometimes a neurosis is set up by a foreign body which has passed on, after temporary impaction, the patient experiencing sensations of pricking and other irritation. If no bone or bristle is found reassurance and some local sedative treatment should lead to disappearance of symptoms.

In the Larynx

Reference has been made to the danger of a large bolus of food lying over the laryngeal aperture or pushed in by blind attempts at extraction. Removal must be rapid to save life, and generally a more useful procedure is the opening of the trachea or larynx. Small objects are seldom arrested in this region. Those which pass through the pharynx usually pass on into the mouth of the œsophagus; if directed into the airway they are likely to be drawn into the trachea and bronchi. Pins and needles, however, may stick in the larynx; they cause temporary cough, followed by a quiescent period, until inflammatory changes cause laryngitis, possibly of a suppurative nature, with perichondritis. Removal through a direct laryngoscope is required, and will be followed by disappearance of symptoms. The proceeding must be carried out with the patient in the Trendelenburg position, as otherwise the dislodged object may pass into the bronchial tree, when the prognosis may become serious.

In the Trachea

Anything which slips through the glottis tends to drop into one or other bronchus and not to stay in the trachea, owing to the considerable size of the latter. Light vegetable objects, such as pieces of nut, may however remain in this part of the airway and will then be blown up and down during inspira-

tion. They do not cause asphyxia by virtue of their size, but give rise to dangerous symptoms because of their irritating nature. Acute tracheitis is produced with abundant secretion and high temperature. Œdema of the glottis may be pronounced and will call for tracheotomy unless bronchoscopic removal is carried out early. Even then dyspnœa may still be distressing, and should be relieved by opening the trachea. The prognosis is grave if this is not done, but is favourable if the correct treatment is followed. The main danger after relief of obstruction at the glottis is from broncho-pneumonia.

In the Bronchi

The prognosis depends on correct diagnosis of the condition and on the possibility of surgical removal. The false hope that the intruding body will be coughed up must not be allowed to prevent bronchoscopic examination, as delay will prejudice the prospects of cure.

There is a vast difference in the prognosis between foreign bodies of vegetable and those of non-vegetable nature. With the former symptoms and signs are early, violent and extremely dangerous, and are caused by the chemical irritation of the intruding substance. As mentioned above, acute tracheo-bronchitis appears, often with œdema of the glottis. The condition is one of urgency and calls for immediate bronchoscopy and removal of the piece of nut, orange or melon pip, or fragment of vegetable. If this is done and if tracheotomy is performed at once should laryngeal obstruction become severe, the prognosis is excellent; if correct treatment is not carried out, owing to lack of skill or opportunity, death is to be expected.

Non-vegetable objects, on the other hand, may lie dormant for months or even years before causing marked symptoms and signs. There is no serious dyspnœa, as the unobstructed lung suffices for respiration. Cough is of temporary duration and only reappears if the object changes its position or if irritation of the bronchial walls leads to inflammatory changes; mucosal swelling and granulations then appear, causing obstruction to the entrance of air and escape of secretions.

Inflammatory changes naturally occur earlier if the foreign body is already infected, as in the case of a tooth, than if it is, for instance, a bead and relatively clean. The patient harbouring an infected foreign body suffers from purulent sputum, sometimes with hæmoptysis, associated with recurrent pyrexial attacks. Lung abscess may ensue and the prolonged suppuration may lead to severe ill-health, with wasting and clubbing of the fingers. Pulmonary tuberculosis must be excluded and a bronchoscopic search then made for the cause of the condition, even in the absence of definite X ray evidence of a foreign body. Pieces of bone or teeth may not show up in radiograms owing to the opacity of collapsed lung.

Except in rare cases, where lung changes are far advanced, removal of the foreign body cures the patient, provided that in the presence of extensive suppuration subsequent bronchoscopic aspiration is carried out. In very advanced cases lobectomy is indicated.

A fine object like a pin may travel down into a distant bronchus and lie dormant for years before causing symptoms. Eventually inflammatory changes occur, and here again the prognosis depends on the question of removal. This requires the use of a double plane fluoroscope. Removal under X ray guidance has considerable dangers unless great care is employed.

In all these cases there is always ample time for all necessary preliminary investigations, including careful radiographic examination. The patient must be transferred to a suitable centre where adequate equipment is available, in the hands of experienced operators. There is no excuse for undue haste or for attempts at removal by those without the requisite skill.

In the Œsophagus

The usual site of impaction is at the crico-pharyngeal fold or, in very young children, rather lower down, at the level of the thoracic inlet. Coins, bones, ordinary pins or safety-pins, and dentures are met with. Smooth objects such as coins are not in themselves likely to lead to a fatal result, although they cause great discomfort and ill-health by reason of partial obstruction to the entrance of food and saliva. A halfpenny may be found, after some three months' sojourn, embedded in granulation tissue, causing dysphagia of considerable but not extreme degree. Careful removal through an œsophageal speculum or œsophagoscope should be followed by a rapid cure; cicatricial stenosis is not likely to follow. It is hasty and ill-considered attempts at blind removal with forceps guided by a finger, or by means of a coin catcher, that lead to danger from injury to the œsophageal walls. An object such as a collar stud, even though smooth, may cause great danger by pressing on the soft posterior wall of the trachea. Early removal gives a good prognosis and tracheotomy should not be necessary. Sharp objects such as bones should be removed as soon as possible, under direct vision, owing to the danger of perforation; contraction of the crico-pharyngeal sphincter may squeeze the object through the hypopharyngeal or œsophageal walls. Early and effective treatment gives an excellent prognosis. Here again attempts at removal by any blind method, as with a probang, are dangerous and unjustifiable. If perforation occurs the outlook is serious, but early external incision and drainage, together with removal of the foreign body, should hold out a good prospect of cure. Laceration of the walls during the removal of a denture fitted with sharp hooks may lead to danger; avoidance of this accident depends on the skill and care of the operator and the suitability of his instruments. Safety is attained, in dealing with cases of a penetrating nature, by removal under general anæsthesia in order to obtain some degree of relaxation of the crico-pharyngeal sphincter.

Most objects which pass the crico-pharyngeal fold and thoracic inlet travel through the œsophagus into the stomach. A bone may, however, pass down the œsophagus and perforate the thoracic segment, with para-œsophageal abscess as a result; the outlook is very bad, but the most hopeful prospect is given by opening the abscess through an œsophagoscope rather than by the external thoracic route.

Summary

No branch of surgery gives such gratifying results as that of foreign bodies. Lack of correct treatment may be followed by prolonged ill-health or death, while removal by suitable methods leads to complete cure. In the majority of cases the prognosis depends considerably on the provision of suitable equipment, used with adequate skill. Hasty and ill-advised attempts at removal afford as great a source of danger as is provided by the foreign body itself.

V. E. NEGUS, M.S., F.R.C.S.,
Surgeon for Diseases of Ear, Nose, and Throat, King's College Hospital.

SPECIAL ARTICLES

PLASTER TECHNIQUE IN THE MODERN TREATMENT OF FRACTURES

By K. H. Pridie, M.B. Lond., F.R.C.S. Eng.

SURGICAL REGISTRAR TO THE FRACTURE CLINIC AND ORTHOPÆDIC DEPARTMENT OF THE BRISTOL ROYAL INFIRMARY

(*Concluded from p. 635*)

The Standard Colles's Plaster

After reduction of the fracture the arm is held by the assistant, who applies countertraction on it, with the elbow bent, whilst the surgeon applies traction on the thumb, so that the hand assumes the position of ulnar deviation, the forearm being fully pronated. A strip of adhesive felt, $\frac{1}{16}$ in. thick by $1\frac{1}{2}$ in. wide, is placed round the arm below the elbow.

THE CAST

1. A dorsal slab is made from a 6 in. by 3 yd. plaster bandage (4 in. for a child). This is made six inches longer than the measurement of the arm from the bend of the elbow to the metacarpal heads (Fig. 13). This slab is placed on the back of the forearm, the extra length being doubled back at the hand to strengthen the wrist portion of the cast (Fig. 14).

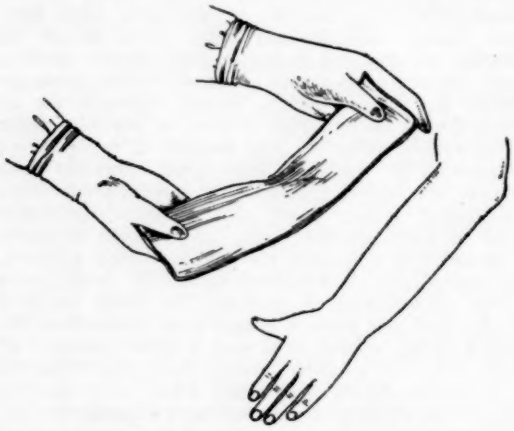


FIG. 13.—Plaster slab applied to the dorsum of the forearm.

The plaster should extend one inch from the olecranon process on the extensor surface of the arm. It should be folded back obliquely (so that it does not press in the antecubital fossa when the arm is flexed) to half an inch behind the metacarpal heads, and the excess turned back over the back of the wrist.

2. The slab is well rubbed on to the hand to exclude air bubbles, and it is fixed to the forearm with a wet gauze bandage, applied from the creases of the wrist to the elbow (Fig. 16).

3. A malleable copper wire band (gauge 12 adults, 16 children) is then made as shown in Fig. 15. This passes round the hand and secures it to the dorsal slab as shown in Figs. 17 and 18.

If the fracture has needed reduction, or if there is much swelling, the plaster should not be completed until the next day, and the patient should be given instructions to keep the hand elevated and not to hang it by his side. Instructions should be given to keep the arm elevated above the rest of the body at night by laying a pillow on the chest and placing the arm thereon. In the day the hand should hold on to the coat lapel of the opposite side.

4. The next day, should the reduction prove to be satisfactory from a second X ray, and should the swelling have subsided, the plaster is completed by the application of a 4 in. by 3 yd. bandage, applied in a circular manner, over the original wet gauze bandage, from the elbow to the creases of the wrist.

FIG. 14. Excess length is turned back.

This standard Colles's plaster is used in :

1. Colles's fracture after reduction. The cast is worn for 4 weeks.
2. Separated lower radial epiphyses in children. The cast is worn for 3 weeks.
3. Greenstick fractures of the lower end of the radius and ulna in children. The cast is worn for 3–4 weeks.
4. Fractures of the scaphoid. These should be put up in radial deviation and slight dorsiflexion, and kept up until X ray shows union, in 3 months or more.
5. Metacarpal fractures.
6. Difficult finger fractures. In (5) and (6) the plasters are slightly modified.

Lower Third of Radius and Ulna

These fractures after reduction cannot be adequately fixed by the short forearm cast just described, because pronation and supination must be prevented. The occurrence of *ununited* fractures of the lower end of the ulna is due to the fact that the movement of pronation and supination is commenced too early ; the rotation occurs about the fracture site in the ulna—thus preventing union.

U-shaped plaster is used for these casts, which are best fixed in the midway position between supination and pronation.

A 30 in. long slab is made from two 4 in. by 3 yd. plaster bandages. This is placed in a U-shaped manner from the metacarpal heads, along the extensor surface of the forearm, round the elbow, and along the flexor surface of the forearm to the crease of the wrist.

This is fastened to the arm by a wet gauze bandage.

A copper wire band is applied as before to hold the hand.

Full Arm Plaster

A band of adhesive felt is placed round the arm just below the axilla.

1. A plaster slab, 24 inches long, is made from two 6in. by 3 yd. plaster bandages (two 4 in. bandages for children). This is placed on the extensor surface of the arm and forearm, which is held in a flexed position just above a right angle and in mid-position between pronation and supination (Fig. 19).

FIG. 15.—Shaped copper wire loop to be attached to plaster slab.

2. This is fixed with a wet gauze bandage.

3. A 24 in. slab made from one 4 in. by 3 yd. bandage is placed to encircle the elbow as shown in Fig. 20.

4. A 24 in. slab made from one 4 in. by 3 yd. bandage is placed round the top of the slab.

5. A copper wire is placed round the hand as previously described (Fig. 21).

The full arm plaster is used for (1) fractures of the upper third of the radius and ulna; (2) fractured head of radius, when the segment fractured is not displaced; (3) supracondylar fractures, after swelling has subsided.

FIG. 16.

FIG. 17.

FIG. 18.

Standard Colles's plaster. A wet gauze bandage over the plaster slab secures the wire loop.

Fractures of the Metacarpals

If there is no displacement the standard Colles's cast, extending to the metacarpal heads, will adequately immobilise the fragments and allow the fingers to be used without pain. If, however, there is displacement, so that the bones are overlapping and the knuckle falls back, an extension apparatus must be fixed to the standard Colles's cast, which is the basis of all finger-fracture casts. A U-shaped wire is joined to the dorsal aspect of the dry cast, so that the limbs of the wire extension run parallel to the finger whose metacarpal has been fractured. The end of this U-shaped wire should project 1½ inches beyond the tip of the finger.

A Kirschner wire is then introduced through the pulp of the finger and an extension is made from this to the end of the wire splint.

FIG. 19.

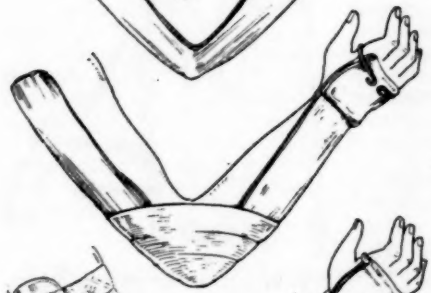


FIG. 20.

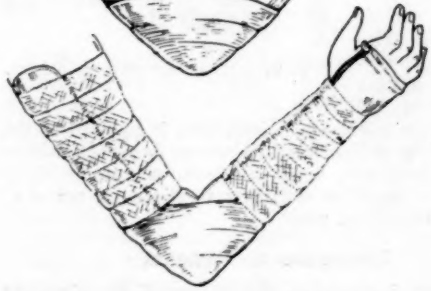


FIG. 21.

Full arm cast, showing wire round hand, and reinforcement of elbow. There are no circular turns of plaster, only of gauze, until swelling has subsided.

Fractures of the Phalanges

The most troublesome of the phalangeal fractures are those through the proximal phalanx. Here the distal fragment tends to be displaced backwards, and these fractures must be treated in flexion. If there is no displacement, the best method of treatment is to place the finger in flexion round a 1½ in. gauze bandage and strap the finger in this position with a strip of elastoplast. The finger is kept in this position for 10–14 days, according to the severity of the fracture.

FIG. 22.—Modified Colles's plaster for severe fracture of proximal phalanx with backward displacement.

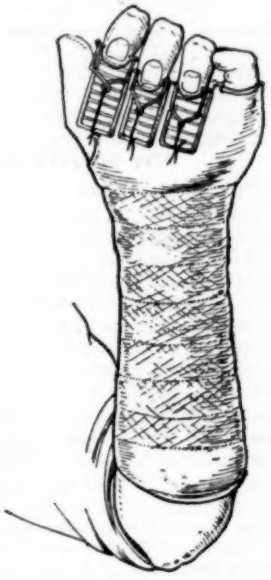


FIG. 23.—Traction applied for multiple phalangeal fracture with displacement.

If there is gross angulation or overlap, traction must be applied to the finger in the flexed position.

The standard Colles's back slab is first applied to the dorsum of the hand and forearm, and fixed with a wet gauze bandage. A ventral slab is then applied extending from just behind the metacarpo-phalangeal joint on the palm to the bend of the elbow.

A Cramer wire splint, ¾ in. wide, which has been bent into a wide U-shape, is padded with adhesive felt on its convex surface, and one end is incorporated in the ventral slab and so fixed that the distal limb of the "U" extends at least 1½ in. beyond the tip of the finger, as shown in Figs. 22, 24 and 25.

A Kirschner wire is then introduced through the pulp of the finger, and extension applied from this to the extremity of the Cramer splint.

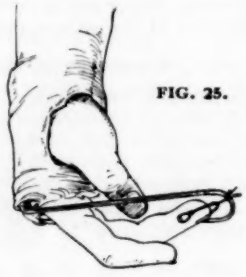
Where many phalanges are fractured the splint is

modified as shown in Figs. 23, 24, and 25. The extension is applied for three weeks to a month, after which active movements are commenced. No physiotherapy should be used until the fracture has united. The same method may be used for the intermediate phalanx. Fractures of the distal phalanx need no special splinting.

For the treatment of torn extensor tendons to terminal phalanges a small slab is made 3 by 2 in. and this is wrapped round the finger, which is kept

FIG. 24.

FIG. 25.



Modification used for compound phalangeal fractures needing traction.

with the terminal joint hyperextended and the first two joints flexed. This should be left on for at least six weeks.

The Skin-Tight Back Splint

This splint is used to immobilise the knee-joint :—

(*a*) In cases of partial fractures of the patella and stellate fractures without displacement (4 weeks).

(*b*) Fractures of the patella after operation enabling the patient to walk with safety after 4 days (4 weeks).

(*c*) Dislocated internal semilunar cartilages after reposition (2 weeks), torn internal or external lateral ligaments or cruciate ligaments (6 weeks).

(*d*) After immobilisation of a tuberculous knee, when the condition is considered quiescent and the patient may commence walking with a guarding plaster (4 weeks or longer).

The method of application is as follows :—

A strip of $\frac{3}{16}$ in. thick adhesive felt, $1\frac{1}{2}$ in. wide, and varying in length according to the circumference of the limb, is placed round the leg four fingers-breadth above the ankle-joint. A second strip is placed obliquely just below the groin.

Four plaster slabs, 33 to 36 in. long, made from two 6 in. by 3 yd. bandages, are placed on the limb—

one on the external aspect
one on the internal aspect
one on the posterior aspect.

The fourth is placed round the top in a circular manner, the remainder is cut off and placed round the bottom. These circular rings prevent the plaster spreading.

The plaster can be completed with a 3 in. wet gauze bandage or, if thought necessary, by two 4 in. by 3 yd. plaster bandages.

Skin-Tight Plaster after Subtrochanteric Osteotomy

The most important part of this operation is the plaster fixation afterwards. This can be simplified if before the operation a standard light below-knee cast is applied and then continued to mid-thigh. A body cast is made with the patient standing. After the operation the two casts are joined together. This only takes a few minutes, and it is easy to determine the right angle of correction.

When the mid-thigh cast has been applied the patient is placed in a standing position on the floor ; the pelvis is then made level by adjusting the affected leg. Adhesive felt is applied to the bony prominences in the following manner :—

1. A strip 2 in. wide is applied over the posterior spinous process from the top of the sacrum to the upper limit of the plaster.

2. A triangular piece covers the sacrum from the tip of the coccyx to the posterior superior iliac spines. Two pieces $1\frac{1}{2}$ in. in width are applied to the iliac crests. One piece, 2 by 3 in. (approximate), is applied to the pubic region.

Two 6 in. by 3 yd. plaster bandages are applied over the full extent of the cast in a circular manner, each turn having a pleat taken in it to make it fit the body accurately without tight pulling. Great care is taken to rub the layers as they are being applied. The remainder of the cast is of slabs made from 6 in. by 3 yd.

The first slab is made 36 in. long from two 6 in. by 3 yd. bandages. This is cut in half and one half applied over the iliac crest from the tip of the sacrum posteriorly, over the crest of the ilium, to the pubis in front. The other half is applied to the opposite side in a similar manner.

Two lateral slabs are made from two 6 in. by 3 yd. bandages and placed laterally. One slab is applied posteriorly over the spinous processes from top to bottom. The top of the plaster is finished by one slab. The whole cast is made smooth by two 6 in. by 3 yd. bandages applied in a circular manner.

The edges are then everted and polished with french chalk ; when the cast is dry the front is cut out.

After the operation of subtrochanteric osteotomy dressings are applied, and then several turns of wood-wool bandage. The two casts are then joined together by four plaster slabs, 2 ft. long, each made from one 6 in. by 3 yd. bandage. Two bandages, 6 in. wide, applied spirally complete the cast.

This method reduces the time of the operation enormously. It is much easier to judge the required correction and angulation. The cast can be fitted so well that the patient is able to start walking after 3 to 4 weeks —often indeed after 1 week.

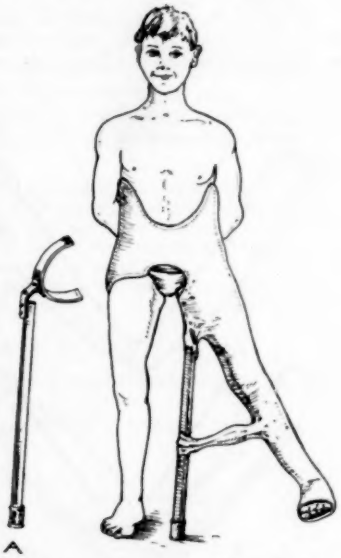


FIG. 26.—Abduction walking plaster.

THE WALKING SPICA PLASTER

If the leg is placed in the neutral position—i.e., 15° flexion and at right angles to the pelvis—a Bristol iron is applied to the bottom of the plaster as in the standard below-knee cast. If, however, there is much abduction it is advisable to apply a third leg to the cast, made of wood and iron (Fig. 26).

Directions to Patients

A printed instruction sheet should be given to each patient treated by a plaster cast. The patient should be made to read it and sign the bottom of the

card. This card is most important, as it will relieve the surgeon of responsibility where the patient fails to attend or does not carry out the instructions.

INSTRUCTIONS TO OUT-PATIENTS WITH FRACTURES (BROKEN BONES), INJURIES, OR DISEASES TREATED IN A PLASTER-OF-PARIS CAST

Name of patient.....

1. For the next.....hours you must lie down.
2. During that time, in the case of a fracture of any bone in the upper limbs, have the hand raised so that it is the most elevated part of the body.

In the case of the lower limbs (for example, a broken ankle) raise the foot of the bed and place the plaster cast on a pillow.

You should report to the casualty department if you notice any tightness of the plaster cast, indications of which will be noticed in the fingers and toes as follows :—

(*a*) Marked swelling.
(*b*) Marked blueness.
(*c*) A tight severe pain which is not eased by elevating the limb.
(*d*) Inability to move the fingers or toes. (You should continually move them even while resting.)
(*e*) Numbness or loss of sensation.

Report daily until further notice.

.....Surgeon-in-Charge.

Patients should be instructed to use the injured limb within the limits of pain, and it should be stressed to them that the more they use the limb the better will be the final result. The patients should not be allowed to use a sling.

SPECIAL INSTRUCTIONS TO FRACTURE CASES TREATED IN PLASTER

A. *Arm Cases*

1. When walking about and not actually using the injured arm you must keep the arm across the chest and grip the lapel of the coat on the opposite side, as long as there is any tendency to swelling. If the injury is below the elbow the arm should be put through the sleeve in about a week's time and the hand used normally.
2. Use the hand and fingers as much as possible for writing, eating, knitting, ordinary household duties, and lifting light objects ; this acts as massage to the injured part. If you cannot use the hand there is something wrong and you must see your doctor again.
3. The fingers, elbow, and shoulder should be put through their full range of movement at least 20 times each day. All joints not immobilised by the plaster must be actively exercised.
4. The wire across the palm must be kept well pressed in the middle of the palm. It should not press on the skin at the sides or impede the grip of the hand.

B. *Leg Cases*

1. For the first week following the application of a plaster cast the leg when at rest should be elevated above the rest of the body. Pain due to swelling can be relieved by raising the leg on a box, on which is a pillow. It is advisable for the first week to keep the leg thus elevated in bed.
2. When not actually walking the leg should be raised on a chair. The patient should not stand about on the leg but sit down with it elevated.

After the first week or two the patient can generally disregard these instructions.

3. Patients should walk as much as possible. At first two sticks should be used, then one, which should be held in the opposite hand to the injured limb.
4. When the rubber is worn out on the walking iron it must be replaced.

After-Treatment

Arm.—After an arm cast has been removed the movements of the various joints should be tested. Half range of movements should be obtained almost immediately, and full range after 14 days in many cases. The patient should be instructed to go home and use the limb as much as possible. Until the dry skin has been removed the affected part should be soaked in hot water, and afterwards rubbed with olive oil, twice a day. The case should be seen again after 14 days ; in cases where it is considered necessary some form of physiotherapy must be ordered. Approximately 5 per cent. of cases need this.

Leg.—After a leg cast has been removed the limb should be washed with some abrasive soap. After this the movements should be tested. The mid-tarsal joints should be gently manipulated with the hand, as adhesions may have formed in these joints following the longer periods of immobilisation. Some form of supporting bandage must be applied : (*a*) viscopaste where there is no swelling ; (*b*) elastoplast if there is swelling. The bandage must be applied to pronate the fore-foot and invert the hind-foot.

(Viscopaste—zinc and gelatin—may, if desired, be hardened with 6 per cent. formalin in spirit.)

PARIS

(FROM OUR OWN CORRESPONDENT)

TUBERCULIN TESTING OF THE FRENCH ARMY

RECENT advances in the study of tuberculosis have done so much to upset certain conceptions with regard to the Pirquet test that it has become necessary to reconsider the whole problem. The director-general of the French Army Medical Service issued in January last a memorandum on tuberculin skin tests in the army. The persons to be tested first are orderlies exposed in the course of their professional duties to infection with tuberculosis ; but it may well be that the investigations will be extended to other units. The idea of a Pirquet comb-out of army units in France is not new ; in 1934 Debenedetti and Foret carried out Pirquet tests on a regiment stationed in St. Germain-en-Laye, and they found 42 per cent. to be Pirquet-negative. In the *Archives de Médecine et de Pharmacie Militaires* for September, 1935, Prof. M. L. E. Pilod, of the military Val-de-Grâce Hospital, devotes a long article to this subject, discussing the administrative measures that may be desirable as a sequel to the findings he anticipates. Impressed by Heimbeck's studies of Pirquet-positive and Pirquet-negative nurses in Oslo, Prof. Pilod suggests that the orderly found to be Pirquet-negative should without more ado be removed from service on cases of tuberculosis likely to cause a massive infection. While this precaution might well be put into force immediately, there are other possible measures whose application must wait. The most susceptible recruits—i.e., the Pirquet-negative reactors—might perhaps be given special quarters or grouped in special units so that they are exposed as little as possible to undetected infectious cases of tuberculosis. With regard to the vaccination of such negative reactors with B C G, Prof. Pilod notes that the experience of Brazzaville has shown that even

adolescents and adults may benefit from the administration of B C G by the mouth. If the subcutaneous route could be avoided without loss of efficacy, and B C G be given as it is to new-born babies, by the mouth, such preventive treatment of Pirquet-negative recruits might well prove a satisfactory solution of one aspect of the problem.

PIERRE MÉNÉTRIER

Prof. Ménétrier, who died recently following a motor accident, was president of the French Academy of Medicine in 1930. Born in 1859, he first attracted attention in the medical world by his study in 1887 of influenza and pneumonia. Thereafter he published a long series of studies of pathological and bacteriological problems, notably on experimental cancer in mice and on cancer produced by X rays. Ménétrier had to face considerable opposition to his conception of cancer, not as a morbid entity, but as the end of a series of "preparatory pathological states." He was a believer in inflammation as a precursor of cancer, and he looked upon gastritis and ulceration of the stomach as forerunners of malignant disease. It was in his capacity of professor of the history of medicine that Ménétrier had a great following, his wonderful memory and scholarly grasp of his subject being keenly appreciated by his pupils.

BUCHAREST

(FROM OUR OWN CORRESPONDENT)

COMPULSORY IMMUNISATION AGAINST DIPHTHERIA

THE Minister of Public Health has made immunisation against diphtheria compulsory for every child under 10 years of age. The immunisation is carried out with the Ramon antitoxin prepared in a Rumanian serological institute owned by Prof. I. Cantacuzino. The inoculations are performed without charge for professional services or material by official physicians, medical officers of health, district physicians, hospital physicians, or school doctors. Elaborate precautions are being taken to compile records of all children and to prevent evasion of the law. After inoculation the children are sent home from school for three days. After this year no children will be accepted in schools unless they produce evidence of having been inoculated against diphtheria, and no uninoculated children will be admitted to children's summer resorts or convalescent homes unless they are Schick-negative.

SPECIAL EXAMINATIONS FOR VILLAGE DOCTORS

The Minister of Public Sanitation issued an order which prescribes that all doctors who wish to obtain positions as medical officers of health in municipalities, rural districts, and villages must pass an examination in public health, forensic medicine, and toxicology. Examinations are to be held only in Bucharest. Candidates for these positions must also (1) possess a qualification obtained from a Rumanian university, and have been officially recognised as having a right to practise; (2) be a Rumanian citizen; (3) produce a certificate from the proper quarter that he has not been sentenced for any misdemeanour or criminal act; (4) has not had to resign from any official post by reason of any abuse or irregularity; (5) hold no other official or private post, and undertake not to accept one while he fills that for which he is a candidate; and (6) produce a certificate that he has fulfilled his military obligations.

A MEDICINAL SALT DISTRIBUTED BY TOBACCONISTS

In Rumania the sale of both tobacco and salt is the monopoly of the State. This circumstance explains, but does not excuse, the efforts made by the State Monopoly Office to push the sale of a proprietary drug described as natural sea-iodine-salt through its agents, the tobacconists' shops. The leaflets advertising the product state that Palladine, a sea-iodine-salt, when dissolved in baths is recommended for rheumatism, arthritis, anæmia, and general debility, that it allays nervous irritation, and cures uterine and ovarian disease. Emphasis is laid on the fact that the Ministry of Public Health has licensed the sale of this preparation in every tobacconist's shop. To this method of advertisement physicians and pharmacists are taking strong exception.

THE BUCHAREST ANTI-RABIES INSTITUTE

The Babes Anti-rabies Institute, so called after its founder, the late Prof. Victor Babes, has just published a report on the five years, 1929–33. The number of suspicious bites during this period was 36,421, distributed as follows:—

	In towns.	In villages.
Bites from dogs	15,491	10,378
,, ,, cats	1,451	406
,, ,, wolves	5	29
,, ,, horses	36	68
,, ,, swine	33	102
,, ,, donkeys	3	10

During the five years under review the number of persons bitten by rabid or suspected animals in Bucharest alone amounted to 9033; the yearly average number of those receiving antirabic treatment was 1806. This figure is alarmingly high in comparison with that of other European capitals—for example, Paris (531), Budapest (438), Vienna (194), Rome (154), Prague (143), or Berlin (36).

In 21 antirabic institutes in other countries 16,328 individuals were treated during 1931, while in the five institutes in Rumania 21,619 received treatment.

ANTISEMITISM AMONG STUDENTS

In his address at the opening of the session Prof. Dr. Gheorghiu, rector magnificus of the scientific faculty of Bucharest University, condemned the attitude during the past year of those medical students who instead of attending to their studies dabbled in nationalistic propaganda. Their antisemitic bias was not shared by their fellow countrymen as a whole. The Rumanian constitution granted citizenship to those of non-Rumanian origin who fulfilled certain conditions, and these citizens could not be prevented from enjoying their lawful right to study at the universities of the country.

"QUALIFIED MASTERS OF DENTISTRY"

The Minister of Public Welfare has issued an order which enacts that all dental technicians, who obtained their qualifications under the law issued in 1924, are to use the title "qualified masters of dentistry" in place of "dental technician" on their nameplate and in advertisements, memorandums, and notes. The intention is to make clear that their occupation is regarded as a trade rather than as an art comparable with medicine.

The Goudard prize offered by the French Medical Academy has been won by Dr. Poenaru-Caplescu, professor of internal medicine at the University of Bucharest, for a thesis on the clinical study of appendicitis, the outcome of researches extending over more than twenty years.

THE MEDICAL REGISTER

UNTRACEABLE PRACTITIONERS, 1935

WE have been requested by the authorities of the General Medical Council to publish the following list of registered medical practitioners who had not, when the list was sent to press, replied to letters written to them on behalf of the Council under Section 14 of the Medical Act, 1858, in order to ascertain whether their addresses on the Medical Register are still correct. The date given after each name is the date of original registration; the qualification given is the principal qualification registered by the practitioner. The letters (E), (S), or (I) indicate whether the practitioner was originally registered in England, Scotland, or Ireland; and the expressions (Col) or (For) indicate that the practitioner is registered in the Colonial List or in the Foreign List in the Register. Any practitioner, wherever resident, who finds his or her name in the list should write without delay to the Registrar, General Medical Council, 44, Hallam-street, Portland-place, London, W.1, unless he or she was originally registered in Scotland. Practitioners originally registered in Scotland should write directly to the Registrar of the Branch Council for Scotland, 44, Queen-street, Edinburgh, 2. The name of every practitioner in the list from whom a further communication is not received at a very early date will be omitted from the next issue of the Register in accordance with the provisions of Section 14 of the Act of 1858.

Aikman, Cedric W., M.B., 1914(S).
Ainsworth, Douglas R., M.R.C.S., 1922(E).
Airey, Geoffrey G., M.R.C.S., 1933(E).
Alexander, Henry S. A., M.B., 1914(S).
Allan, Hamish, M.R.C.S., 1932(E).
Allen, Vincent E. N., M.R.C.S., 1928(E).
Anderson, James C., M.B., 1915(S).
Anderson, James McL., M.R.C.S., 1928(E).
Atkinson, Thomas R., M.D., 1881(E).

Barrett, Ernest, M.R.C.S., 1886(E).
Baxter, George S. M., L.R.C.P., 1882(I).
Beggs, George E., L.R.C.P. & S., 1911(I).
Bennett, Thomas, M.B., 1903(S).
Bentlif, Philip B., M.R.C.S., 1883(E).
Bhuttacharji, Jitendra C., L.R.C.P. & S., 1895(S).
Birch, Philip, M.R.C.S., 1874(E).
Birrell, David A., L.R.C.P. & S., 1893(S).
Blake-Campbell, John F., L.R.C.S., 1884(I).
Brogden, George A., M.D., 1899(S).
Brown, Doris, M.B., 1921(E).
Browne, Frederick G. F., M.B., 1912(E).
Bryan, Cyril P., M.B., 1921(I).
Buck, Mary, M.R.C.S., 1923(E).
Burke, Hubert W., L.R.C.P., 1883(E).
Burke, Ulick J., L.R.C.P. & S., 1897(I).

Cambridge, William R., M.R.C.S., 1933(E).
Campbell, Angus, M.B., 1893(S).
Carter, Henry F. (formerly Cohen, Highman F.), M.B., 1932(E).
Clements, John H., L.S.A., 1902(E).
Cooper, Edward H., M.R.C.S., 1896(E).
Corke, Cecil A., L.R.C.P., 1878(E).
Coventry (Mrs.), Gladys A., M.B., 1928(E).
Curaba, Francesco, M.D., 1930(For).
Cussen, Gerald E., M.B., 1920(Col).

Davidson, Georgina E., M.B., 1915(S).
Denton-Fethers, Percy, L.R.C.P. & S., 1893(E).
De Silva, Kariyawasan W. T. J., L.M.S., 1919(Col).
Devonald, Alfred E. L., L.M.S.S.A., 1911(E).
Dickson, James A., M.C.P. & S., 1930 (Col).
Dornford, Charles T., M.R.C.S., 1885(E).
Duguid, Nigel, M.B., 1924(S).
Dunlop, John, M.B., 1906(I).
Dunlop, Robert H., M.B., 1924(S).
Dyson, Percy A. S., M.R.C.S., 1909(E).

Earle, Percy M., L.R.C.P., 1886(E).
Eccles, John Y., M.R.C.S., 1925(E).
Edwards, Howard S., M.R.C.S., 1926(E).

Findlay, William D., M.B., 1895(S).
Forrest, John G. S., M.R.C.S., 1877(E).
Forsyth (Mrs.), Edith M., M.B., 1927(E).
Freeman, William J., M.B., 1929(Col).
Fyffe, Andrew A., M.R.C.S., 1912(E).

Games, John H. P., M.R.C.S., 1928(E).
Gibbon, Thomas H., *O.B.E.*, M.D., 1903(I).
Gollerkeri, Ganesh V., M.B., 1922(Col).
Good, John R., M.D., 1920(Col).
Gunn, Michael B., L.R.C.P. & S., 1917(I).

Hankin, Stanley, M.B., 1932(S).
Harrison, Tilson L., M.C.P. & S., 1923 (Col).
Hart, Herbert F., M.B., 1898(E).
Hartzhorne, Bernard F., M.R.C.S., 1884(E).
Henstock, John L., M.R.C.S., 1890(E).
Hepburn, Aglionby D., M.B., 1921(E).
Holmes, Joseph, L.R.C.P., 1882(E).
Horsley, Lancelot, M.R.C.S., 1915(E).
House, Denis R., M.R.C.S., 1928(E).

Jefferson, Robert P., M.R.C.S., 1884(E).
Jenner-Clarke, Reginald, M.R.C.S., 1919(E).
Johnstone, Robert, M.B., 1925(S).
Jones, Arthur R., M.R.C.S., 1897(E).
Jones, David W., M.R.C.S., 1914(E).

Knowles, Beatrice, M.D., 1897(E).

Lansdown, Alice E., M.R.C.S., 1922(E).
Lee, Alfred W. H., L.R.C.P., 1882(E).
Lee, Daniel, M.S., 1885(E).
Leigh, Annie T., M.B., 1925(E).
Lewis, John G., L.M.S.S.A., 1915(E).
Lewis, William E. V., M.R.C.S., 1901(E).
Lindsay, Douglas M., M.D., 1919(S).

Macarthy, James J., M.D., 1859(I).
McCausland, Samuel R., L.R.C.P. & S., 1901(I).
Macfarlane, James, M.B., 1921(S).
Macgregor, Duncan M., L.R.C.P. & S., 1899(S).
McGuckin, John B., M.B., 1925(I).
Mackay, Margaret S., M.B., 1925(S).
Malcolm, Robert J. W., M.B., 1931(Col).
Martin, Henry O., M.B., 1926(E).
Martin, James H., *D.S.O.*, M.R.C.S., 1864(E).
Martin, John, L.R.C.P. & S., 1914(S).
Mazzarella, Gerardo, M.D., 1930(For)
Mehta, Nanalal M., M.R.C.S., 1912(E).
Moore, Alexander G. H., M.R.C.S., 1913(E).
Moore, George L., L.R.C.P., 1885(E).
Moorhead, William St.L., L.R.C.P. & S., 1908(I).
Mortimer, Hector, F.R.C.S., 1914(S).
Mortimer, Leonard W., M.R.C.S., 1914(E)
Muirhead, Edith A., M.R.C.S., 1932(E).

Nasmyth, Roy D., M.C.P. & S., 1920(Col).

O'Donnell, Patrick J., M.D., 1921(I).
Orlek, Aaron, M.R.C.S., 1934(E).
Owens, Robert D., M.B., 1925(E).

Peake, Dorothy E., M.R.C.S., 1924(E).
Penny, Jeremiah, M.R.C.S., 1887(E).
Perkins, Herbert E., L.R.C.P., 1908(E)
Plunkett, Bernard, L.R.C.P. & S., 1925(I).
Powell, Walter A., M.R.C.S., 1892(E).

Rice, Charles E., L.M.S.S.A., 1918(E).
Robinson, John B., M.R.C.S., 1928(E).
Roche, James L., L.R.C.P. & S., 1933(S).
Row, Kalyanpurker R., M.B., 1928(Col).

Saayman, Donald H., M.B., 1922(I).
Sadleir, Richard E., L.R.C.P. & S., 1923(I).
Sahai, Bishambhar, M.R.C.S., 1916(E).
St. John, Alfred H. V., L.R.C.P., 1908(E).
St. John, Frederic A., F.R.C.S., 1919(E).
Salama, Anis, M.R.C.S., 1923(E).
Sampey, Alexander W., M.R.C.S., 1933(E).
Sand, Charles, M.B., 1914(S).
Sanders, Gerald G., M.B., 1921(S).
Sargent, Henry B., M.B., 1917(S).
Schenck, Edward, M.R.C.S., 1907(E).
Scully, Reginald W., L.R.C.P. & S., 1895(I).
Scutt, Tom, M.R.C.S., 1884(E).
Seccombe, George S., M.R.C.S., 1874(E).
Sethna, Dosabhoy C., M.B., 1898(E).
Shaw, Freni M., M.R.C.S., 1933(E).
Sheedy, John, M.D., 1884(I).
Sheehan, William B. J., M.B., 1928(Col).
Sheehy, Charles, M.B., 1926(I).
Sheridan, John J., M.B., 1921(I).
Shiel, George A., L.R.C.P. & S., 1912(I).
Shiga, Hidetoshi, M.B., 1933(For).
Shlosberg, Nathan, M.B., 1933(E).
Short, Richard C., M.B., 1927(I).
Shutt, Jonathan, M.R.C.S., 1925(E).
Sieff, Samuel, M.B., 1922(S).
Simon, Keith M. B., M.B., 1915(Col).
Simpson, Alexander B., M.B., 1899(S).
Simpson, Frederick H., M.B., 1894(E).
Singer, Arthur L., M.R.C.S., 1907(E).
Sinha, Ugra P., M.R.C.S., 1929(E).
Smith, George, L.R.C.P., 1876(I).
Smith, George C., M.D., 1872(E).
Smith, Gilbert T., M.R.C.S., 1881(E).
Smith, Hubert, M.B., 1926(E).
Smith, Issachar R., M.R.C.S., 1914(E).
Smyth, Edward W., M.B., 1902(S).
Smyth, George J. C., F.R.C.S., 1914(E).
Snijman, Esaias R., M.B., 1904(S).
Solomon, Nathan, M.R.C.S., 1930(E).
Souter, James, M.B., 1902(S).
Southern, Francis G., M.R.C.S., 1885(E).
Speedy, Isabella H., M.B., 1923(I).
Spurrier, Alfred H., *C.M.G.*, *O.B.E.*, L.R.C.P., 1891(E).
Stansfeld, Elsie, M.R.C.S., 1916(E).
Starkie, Ernest T. W., M.R.C.S., 1929(E).
Steele, Duncan J., L.R.C.P. & S., 1917(I).
Stephens, Robert S., L.R.C.P. & S., 1907(I).
Stephenson, Kathleen E. V., M.B., 1926(I).
Sterne-Howitt, Harold, M.R.C.S., 1916(E).
Steuart, William, M.R.C.S., 1911(E).
Stokoe, Lucy, M.B., 1928(E).
Stoney, Robert T., L.R.C.P. & S., 1917(I).
Story, Alfred C., L.S.A., 1905(E).
Stott, William A., M.B., 1890(E).
Strahan, Stuart S., M.B., 1909(E).
Stuart, Annie R., M.B., 1924(S).
Stuart, John, M.B., 1924(I).
Svensson, Robert, M.B., 1908(E).
Sweet, William S., M.B., 1904(E).

Tate, Arthur L., L.R.C.P., 1876(E).
Taylor, Shephard T., M.B., 1865(E).
Tha, Richard R. H. O., L.M.S.S.A., 1915(E).
Thomas, David H. H., M.R.C.S., 1932(E).
Thomson, Ian C., M.B., 1923(S).
Thomson, John G., L.R.C.P. & S., 1893(S).
Thornton, Patrick A., M.B., 1929(I).
Tizard, Henry J., M.R.C.S., 1890(E).
Tremble, John, M.B., 1911(E).
Trotter, Dorothy I. (formerly Henry), M.B., 1924(I).
Trotter, George J. E., L.R.C.P., 1886(E).
Trotter, Ninian G., M.D., 1889(E).

van Niekerk, Sebastian V., M.B., 1906(S).
van Zijl, William J., M.B., 1926(I).
van Zyl, Andries B. W., M.R.C.S., 1925(E).
Varley, Minnie F., L.R.C.P. & S., 1926(S).
Varughese, Mangattu K., M.B., 1904(E).
Verheyden, Walravine J., L.M.S.S.A., 1922(E).
Verver, Bernard T., M.R.C.S., 1911(E).
Vigne, Alfred, M.D., 1890(I).
Viviers, Philip R., M.R.C.S., 1925(E).

Wadsworth, Guthrie M., M.B., 1923(E).
Wall, Winifred E., M.B., 1926(S).
Walsh, James, M.B., 1925(I).
Walsh, Una, M.B., 1921(I).
Walsh, Vincent G., M.B., 1921(E).
Walt, Maurice L., M.R.C.S., 1933(E).
Walters, St. D. G., L.R.C.P., 1881(E).
Wang, Chung C., M.D., 1914(S).
Ward, Charles, F.R.C.S., 1876(E).
Ward, Howard P., *M.B.E.*, M.B., 1887(E).
Warren, Charles F., M.R.C.S., 1891(E).
Warrington, William O., M.B., 1925(I).
Watkins-Baker, Lionel C., M.R.C.S., 1912(E).
Watkins-Pitchford, Henry O., M.R.C.S., 1924(E).
Watson, Thomas A. N., *M.C.* (formerly Watson, T. A.), M.D., 1910(I).
Watson, William H., *M.C.*, L.M.S.S.A., 1911(E).
Weakley, Arthur, M.R.C.S., 1879(E).
Webner, Ralph A., M.B., 1925(I).
Wedgwood, William B., M.R.C.S., 1887(E).
Welchman, Edward, M.R.C.S., 1872(E).
Wells, William G. P., M.B., 1927(E).
Wesson, Reginald A., M.R.C.S., 1931(E).
Weston, Alfred W., M.B., 1914(E).
Weston, Joseph T., L.R.C.P., 1885(E).
White, Edmond, M.B., 1922(I).
Whitsitt, Leslie M., M.B., 1925(I).
Wicht, Johan F., M.B., 1920(I).
Wickham, Harrie B., L.R.C.P., 1907(E).
Wilkie, Dorothy M., M.B., 1924(S).
Williams, John R., M.D., 1922(S).
Williams, Sybil O., M.R.C.S., 1929(E).
Williams, William G., M.B., 1899(S).
Willson, Howard S., M.B., 1893(E).
Wilson, Albert A., M.R.C.S., 1930(E).
Wilson, Cecil S., M.B., 1921(I).
Wilson, William C., F.R.C.S., 1898(S).
Winch, Eric W., M.R.C.S., 1928(E).
Wood, Howard J. F., L.M.S.S.A., 1926(E).
Wood, John, L.S.A., 1893(E).
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PANEL AND CONTRACT PRACTICE

Changing Doctor: the Problem of Clause 4 (4)

WHEN an insurance committee, after consultation with the panel committee, are satisfied that owing to the continued absence or bodily or mental disability of an insurance practitioner his obligations under the terms of service are not being adequately carried out they may with the consent of the Minister give noticed to the insured persons on his list that the practitioner is no longer in a position to carry out his obligations under the terms of service. So runs Clause 4 (4). In a case of continued absence—for which phrase abandonment of the practice may be substituted—committees usually inform the insured persons that they may select another doctor, assuming of course that the panel committee have been consulted and the Minister has given his consent to Clause 4 (4) being brought into operation. But in a case of physical presence, accompanied by bodily or mental disability, the committee may give notice that the practitioner is no longer in a position to carry out his obligations, but they can neither scatter the practice nor remove the doctor's name from the list. The unfortunate insured person who has received the notice must either continue to obtain treatment from the doctor who, he has been told, is (so to speak) not up to the job or else he must go through the solemn ritual of transferring by consent. This farcical position is doubtless due to the fact that when Clause 4 (4) was drafted insured persons could transfer whenever they liked, in exactly the same way as private patients, but with the advent of Article 16 (1) of the 1928 regulations transfers locally can be effected only if both doctors consent in writing, or alternatively if the consent of the insurance committee has been obtained. So if the patient goes to another doctor—surely the obvious thing to do—he must pay for the privilege until he can secure a transfer which may not become valid for perhaps four months.

An insurance committee in the Midlands being dissatisfied with the position has had it referred to its medical service subcommittee to consider whether an attempt should not be made to secure the removal of the doctor's name from the medical list. Article 34 of the regulations gives the committee power, after an investigation by the medical service subcommittee, if they are of opinion that the continuance on the medical list of the practitioner will be prejudicial to the efficiency of the medical service of the insured, to make representations to that effect to the Minister. But Article 47 clearly provides for representations being made in other ways—and by other persons and bodies—and so cases may well arise in which Clause 4 (4) having been invoked upon the recommendation of a medical benefit subcommittee a representation may be made upon the request of the same subcommittee, or indeed by the insurance committee itself.

This point was brought out in an inquiry held in 1923, where counsel for the respondent submitted a preliminary objection to the inquiry proceeding on the grounds that under the terms of the 1923 Medical Benefit Regulations an insurance committee were not competent to bring forward and ask for the hearing before the inquiry committee of a representation owing to the fact, which was afterwards proved in evidence, that no investigation of the matters alleged against him in the representation had taken place before the medical service subcommittee. The inquiry committee over-ruled the objection, holding that Part VI. of the regulations formed, in a sense, a separate code under which the committee could themselves move *de novo* for an inquiry by representation and that the terms of Articles 41 and 42 of those regulations enabled them to proceed without a preliminary investigation or report by the medical service subcommittee. The inquiry committee pointed out that the terms of the regulations lacked clearness in a certain degree on this point in that a declaration of the substantive right of the committee to make a representation of the kind under review was actually found in Article 30—a regulation dealing with investigation by the medical service subcommittee—and that the power to make a representation under Part VI., if that part were rightly viewed as a separate code, was expressed somewhat hypothetically in Article 42.

The respondent in this case applied to the King's Bench division of the High Court to have the decision of the Minister quashed, the principal ground of the application being that the insurance committee had made representations without first directing an investigation by the medical service subcommittee and that the whole of the proceedings were thereby vitiated. But the case was dismissed with costs.

It seems ludicrous that insured persons should be compelled to obtain treatment from, and that insurance committees should have to pay, doctors who have been found by the Minister, the insurance committee, and their professional colleagues on the panel committee, to be unfit to perform their duties.

Costly Certificates

There are probably few insurance doctors who are not asked from time to time to issue certificates of incapacity in respect of patients they have not seen during the previous 24 hours, and possibly there are fewer still who could be certain that they had never done so. A few weeks ago the London medical service subcommittee dealt with two such cases. In the former the doctor had issued weekly certificates to the wife of an insured patient whom he knew was an inmate of a sanatorium, "being under the impression that he was required to supply such certificates even though he had not seen the patient." A para-

graph from the subcommittee's report sums up the position as follows :—

Rule No. 9 of the Medical Certification Rules provides that a practitioner having issued a certificate under the rules shall not issue a further certificate without again examining the insured person. The facts of the case were admitted by the practitioner, and it is clear that he, in contravention of the rule referred to, issued certificates in respect of the insured person on dates on which he did not see him and when, as a matter of fact, the insured person was an inmate of a sanatorium. The practitioner seems to have given the certificates without a due sense of responsibility and to have failed to appreciate that the printed words on the form of certificate issued for the use of practitioners contain a statement of fact. It appears to us that the practitioner could not have been under any illusion when he put his signature to statements which were not true, namely, that he examined the patient on dates when he had not seen him. No question arises as to the continued incapacity of the insured person, but it is a matter for surprise that a practitioner who has been on the Committee's Medical List for many years should have been so ignorant of the requirements of the Medical Certification Rules.

In the other case, also of a patient suffering from a tuberculous condition, the patient obstinately refused to follow the line of treatment prescribed for him, although the doctor did his best to meet his various predilections, and eventually it became clear that it was useless to make further visits to a patient who would neither take his medicine nor carry out the treatment prescribed for him. But the man was incapacitated and the doctor yielded to the requests of the wife that he should issue certificates hoping throughout that the patient would change his mind and agree to accept appropriate treatment.

Both doctors are likely to be poorer to the extent of £2 as the result of what they no doubt regarded as a technical error, but which the service subcommittee had no option but to treat as a breach of the terms of service.

PUBLIC HEALTH

The Future of the Health Services in Scotland

In his presidential address to the congress of the Royal Sanitary Association of Scotland, Dr. G. V. T. McMichael, medical officer of health for Paisley, dwelt upon the need for unravelment of the present confusion of the health services, and the enrolment of the general practitioner in a service the first object of which would be preventive rather than curative. The general practitioner, he suggested, will require to put away much of the strongly individualistic attitude of his predecessors, and become a unit in a large team. In an organised service his work would be easier and certainly more interesting, for he would have at his back all the resources of a complete medical service, including an adequate nursing service, to assist him in his domiciliary work. The existing medical services made practically no provision for a large number of the population who are not in a position to provide for themselves; not one of them was complete, and their administration was divided among different authorities which did not coöperate with one another. The time had arrived for a planned national policy, regulating the development of all the health services, in a way comparable with the coördination and organisation of educational effort. It should aim at (1) a complete environmental health service, and (2) a complete national medical service, to the benefits of which every member of the community should have access. The distinction was one of convenience; the two branches were essentially interlinked. Dr. McMichael, discussing the relative merits of a whole-time salaried service, as compared with a development of the panel system, came down definitely on the side of the latter, partly because of the personal bond between patient and doctor which free choice preserves, and partly because of the detrimental effect upon efficiency and the lack of incentive in a whole-time service, where promotion must depend largely upon seniority. As part of the national provision for health there should be a maternity scheme managed by the local authorities, affording efficient midwives, competent medical care, and adequate institutional beds to meet the requirements of every expectant mother. Some way must be found of bringing the voluntary hospitals within the scope of a national service without destroying their individuality and voluntary character. There must be much more active and definite coöperation between the managers of these institutions and local authorities than there has been in the past.

Criticism of the present divisions of local government and proposals for reform have been much bolder in recent years in Scotland than south of the Border. Dr. McMichael, in his address, dwelt upon the necessity for unifying all the medical and health services under one authority. The congress devoted the remainder of the session to discussing the evolution of local government. In a paper on this subject Dr. John Ritchie, medical officer of health for Dumfriesshire, traced the history of local government in Scotland, and pointed out that health authorities of the future must have at their disposal all the resources of modern medical science. Some measure of combination or unification of the present numerous authorities seemed inevitable. Dr. C. W. Sleigh, vice-convener of the county of Aberdeen, described the regional medical scheme at present in operation in Aberdeen, city and county, and the county of Kincardine, which preserved autonomy but ensured the greatest measure of coöperation between the city and the counties. Schemes of this kind, breaking down barriers between the counties, cities, and small burghs, and pooling the hospital and specialist resources of areas, were essential to the development of the medical services. He supported the regional scheme advocated by the Scottish Department of Health, centred on Inverness, Aberdeen, Dundee, Edinburgh, and Glasgow, which has already been described in these columns.[1]

In the discussion of these papers, Bailie Stewart Reid, convener of the public health committee of Glasgow, referred to the new arrangements for domiciliary medical assistance of the poor in that city. It had been decided to abolish all part-time service for this purpose and establish a staff of whole-time practitioners. The day of private practice was past. National health insurance, he was satisfied, had served its day and generation, but was now obsolete. He was convinced that a whole-time service would come, and Glasgow's recent decision was a step toward it. This point of view is not uncommon among the lay members of local authorities, and the reactions of the public in Glasgow and

[1] THE LANCET, 1935, i., 887.

in areas where the open choice system has been adopted will no doubt be studied carefully by the government departments concerned.

Infection in Swimming Baths

Scarlet fever, although maintaining its usual low summer prevalence, has been occurring throughout August at a level rather above expectation. In Chelmsford it has suddenly taken epidemic form at an unusually early period in the season. From an incidence of one to two cases per week during the summer, notifications increased to 9, 223, and 58 in the weeks ended August 24th, August 31st, and Sept. 7th respectively. Figures of this order clearly indicated some special source of infection, which has proved to be a milk-supply, with regard to which particulars are not yet available. Among the steps taken to prevent the further spread of infection, the corporation swimming baths have been closed from Sept. 13th until further notice, on the recommendation of the medical officer of health, Dr. J. C. Sleigh. It would be interesting to know whether there has been definite epidemiological evidence that the disease has actually been spread in this way in Chelmsford. In a fairly exhaustive survey of the literature of the subject [1] written by Dr. J. Alison Glover and other officers of the Ministry of Health in 1929, while the possibility of such an occurrence was mentioned in connexion with small crowded and polluted school baths—and it was recorded that Dr. Griffith had been successful in isolating a hæmolytic streptococcus from one of four samples of bath water submitted for the purpose—it was pointed out that remarkably little had been heard of the transmission of scarlet fever and other nasopharyngeal infections by swimming baths. Since then nothing has happened to call for qualification of this statement.

In times of emergency extraordinary measures must often be taken to allay public alarm. It is clear that the risk of infection is always greater where many young people congregate. Covered swimming baths are often crowded and ill-ventilated. Bathers, becoming chilled and temporarily deprived of the protective secretions of the mucous membranes of their nasopharyngeal passages, may be more than normally susceptible to infection. On general grounds therefore there is justification, during an exceptional epidemic of scarlet fever, for closure of swimming baths belonging to a public body, although other centres of perhaps equal risk cannot so easily be dealt with because of their private ownership.

A Curious Epidemic of Sore-throat

The Northampton coroner inquired on Sept. 9th into the death of a 13-year-old girl, one of a family of six children at the village of Badby, all of whom had been taken ill. The sequence of events was this. The first case was a girl, aged 6, who sickened on August 17th and recovered. The second, a boy aged 8, was taken ill on August 18th and died at home on the 23rd, the cause of death being certified as cardiac failure, septicæmia, streptococcal infection of tonsils and fauces. The third, a girl aged 13 (the subject of the inquest), fell ill on August 19th. A swab taken from the throat proved negative for diphtheria. The child was removed to Northampton General Hospital where she died on August 25th, the cause of death being certified as cardiac failure due to spirochætes of Vincent's angina. The fourth, a boy aged 13 months, taken ill on August 29th, was at once removed to the general hospital where throat swabs proved positive for diphtheria and the child was transferred on Sept. 17th to the Staverton Isolation Hospital. The fifth, a boy aged 12, and the sixth, a girl aged 14, were notified on August 31st and Sept. 3rd respectively as suffering from diphtheria and were removed direct to the isolation hospital, where they were both regarded without question as cases of diphtheria. Both are now doing well. A brook running through the village of Badby was blamed for the outbreak, and Dr. A. R. Darley, M.O.H. for the rural district, had the water examined both chemically and bacteriologically; it was stated to be of unusually good quality for a brook water. A septic tank which also came under suspicion has been attended to. Dr. Darley himself regards the probable cause of the outbreak to be a diphtheria carrier; the boy of 12 now in the isolation hospital may prove to have been the carrier. Father, mother, and eldest son, aged 18, in the affected family remain well.

The Keeping of Records

Practitioners may still be heard to complain about the record keeping that the insurance medical system imposes upon them. Yet when they were students they were taught, as clinical clerks, to note the salient facts of a case for future reference. Where patients or problems are handled from time to time by different—and changing—members of a team, accurate recording is the essence of an intelligent and continuous service. Public health workers are thus accustomed to the use of record forms and learn to appreciate their value. Forms are to administration what machinery is to industry; they enable an object to be reached with the minimum of effort. Red tape, often a term of opprobrium, is an effective part of departmental machinery so long as it is used to bind the records and not the minds of its officers.

In one public health department, where a serious effort is made to scrap unnecessary forms periodically and to avoid the needless introduction of new ones, the number of different forms is found, we are told, to total more than 250. These, it should be understood, include various legal notices, intimations to parents, and the like, but the number of forms needed purely for record purposes is large. Many have been devised to suit what appeared to be the requirements of the department and are not based on any model, although in certain services, like that relating to the health of school-children, the returns required by government departments govern the forms of local records. In this connexion a book published by the Commonwealth Fund [1] should be of some help to medical officers in this country, although it is designed to suit American conditions. It discusses the desirability of uniformity of record keeping in health departments, and suggests the most useful forms which might be used for various purposes. Model forms are presented in 79 figures, and the Commonwealth Fund offers permission to health agencies, on application, to use them under its copyright. Public health officers will find in it much useful guidance.

[1] The Purification of the Water of Swimming Baths. H.M. Stat. Office. 1929.

[1] Recording of Local Health Work. By W. F. Walker and C. R. Randolph. London: Oxford University Press. 1935. Pp. 275. 8s. 6d.

REBUILDING A LEEDS HOSPITAL.—Leeds corporation health committee have approved plans for modernising and extending St. James's Hospital at an estimated cost of over £110,000. This should relieve the overcrowding at Leeds General Infirmary. The plans include a pathological block, operating theatres, and a nurses' home.

CORRESPONDENCE

MANDELIC ACID

To the Editor of THE LANCET

SIR,—Since the publication of my preliminary experiments on the use of mandelic acid in the treatment of urinary infections (THE LANCET, 1935, i., 1032) a more extensive series of cases has been treated with satisfactory results. In the original paper a warning note was added concerning the occurrence of casts in the urine of patients under treatment and since then casts have been found in the urine of a number of other cases. These have been both hyaline and granular in nature and have occasionally been accompanied by albuminuria. On stopping the treatment the casts and albumin have, in every case, promptly disappeared and no evidence of any impairment of renal function has been obtained.

The occurrence of casts in an acid urine, such as is produced by these patients, is of doubtful pathological significance. Recently some evidence has been obtained that the renal irritation responsible for the formation of the casts may be due to the ammonium chloride rather than to the mandelic acid, and it is therefore suggested that the treatment be started with a daily dose of four (instead of eight) grammes of ammonium chloride, which should only be increased if the urine does not become sufficiently acid.

In any case, as previously emphasised, the occurrence of casts or of albumin is an indication that the treatment should be pursued with caution and it should be remembered that the use of ammonium chloride is always inadvisable in the presence of renal failure.

I am, Sir, yours faithfully,

M. L. ROSENHEIM.

Hampstead, N.W., Sept. 21st.

ARTIFICIAL RESPIRATION

To the Editor of THE LANCET

SIR,—I read with interest the leading article in THE LANCET of July 20th based on my article on the best method of manual artificial respiration in the same issue, and I was glad to learn that you think I have made out a good case for preferring Silvester's method to Schäfer's. However, you add that any method which is to be generally adopted should be easily learned and applied by unskilled persons and that in this respect Schäfer's method has the advantage. I grant you this, but before a method can be recommended it must be established that its physiological basis is good, and this is the more essential because it is difficult to draw conclusions from the results of applying any method in ordinary practice. Prof. Henderson has often pointed out that, in cases of so-called apparent death, as a rule it is not known what the condition of the patient was, when he was seen for the first time, because assistance was given by laymen before any doctor was able to determine it. In many cases of apparent death, treated with alleged success, my experience at the Dutch Society for Saving Drowned Persons makes me doubt if the respiration really stopped entirely and if no pulsation was to be felt; in most cases the reflexes were certainly still present, and in such cases various kinds of simple manipulations might have been successful.

My next point is this. Bruns, whom I quoted in my paper, has demonstrated that if in an apparently dead person the reflex irritability is abolished and the respiratory centre does not react to stimuli, no method of artificial respiration can be effective unless it causes blood to flow from the great veins to the right heart and thence through the lungs to the left heart; and Bruns's investigation showed that Silvester's method—and in a lesser degree Howard's method—does this, whereas Schäfer's method does not. It is an established fact that, when a cadaver lying on its back is turned over, the manometer registers a positive blood pressure of 12 cm., which remains fairly constant in spite of strong expiratory pressure; this alone is sufficient to condemn Schäfer's method and other methods in which the apparently dead person is laid on the abdomen. Bruns's experimental investigations were strictly controlled. They have been confirmed by Thiel, and as long as they are not disproved—and Prof. Henderson has not done so—they remain valid.

In my capacity of Secretary-General of the International Association I welcomed the opportunity of publishing an article in your columns, as it seemed to me that some German and Scandinavian publications were not sufficiently known to English and American writers. For collaboration in war-time and at great disasters, it is of international importance to know which method is most to be recommended, and this can only be solved by world-wide collaboration.

Prof. Henderson claims that "no method of manual artificial respiration can do more than induce rhythmic expirations," but he does not support this opinion by argument; and the investigations of Ploman, Liljestrand, Bruns, and others, besides myself, prove the contrary. Prof. Henderson also expresses the opinion that when artificial respiration is being done the inspirations which occur between the forced expirations are due solely to the tonus of the victim's own muscles, and this view is also contrary to the experience of the investigators I have mentioned. Prof. Henderson points out himself in your next issue (page 178) that the muscular tone in an apparently dead person, in whom reflex irritability is abolished, is very low and soon reduced to zero. The muscular tonus of young vigorous students which he mentions is therefore irrelevant.

Elsewhere (Münch. med. Woch., 1935, i., 2) I have set out why the methods of Jellinek and of Holger-Nielsen present no advantage.

I am, Sir, yours faithfully,

Amsterdam, Sept. 12th. C. J. MIJNLIEFF.

*** We have received from our Australian correspondent a letter in which he says: "Dr. Mijnlieff's contention that the Silvester method of resuscitation is preferable to the Schäfer will find few supporters in Australia, where experience in the treatment of drowning is comparatively large and the Schäfer principle is the only one extensively taught. The beaches, where millions of people spend their week-ends bathing each year, are patrolled by members of the Surf Life Saving Association of Australia. During the ten years 1925–1935, this association has records of resuscitation by a slight modification of the Schäfer method on 1471 patients; actually no death from drowning occurred on any beach whilst a patrol was present. Rapidity of rescue must be a factor in such success, but much of the credit is undoubtedly due to the method of resuscitation. The rate of 12 per minute adopted by the association

was determined by a medical committee after a series of experiments carried out at Sydney University by Prof. H. Whitridge Davies, who found that 15 per minute, the rate previously used, produced considerable over-ventilation. A comparison was also made in these experiments between the Schäfer and the Silvester methods, from which the conclusion was drawn that the Schäfer method was to be preferred."—ED. L.

BACTERIOLOGY OF RHEUMATISM

To the Editor of THE LANCET

SIR,—I am very grateful to Prof. Wilkinson for giving me the clue to Dr. Mantle's paper, and for his kindly personal reference. His letter stirred my subliminal consciousness, and a vague memory of 35 years ago bid me to look up THE LANCET, 1900, ii., 1306, where I found a letter signed by the late Dr. Alexander Paine and myself. I quote a few essential lines.

"To Dr. Mantle we owe an apology. . . . There can be no doubt that in 1887 Dr. Mantle fully recognised the likelihood of rheumatic fever being due to an infection, and that he further carried out some important and laborious investigations in support of his contention."

The nature of these was indicated in that letter, and are given by Prof. Wilkinson.

At the present time, thanks to the paper by Schlesinger, Signy, and Amies (THE LANCET, 1935, i., 1145), upon a possible virus causation, the whole question of the ætiology of rheumatism has been revived, and with energy—perhaps with forgivable energy—I fought for the work and results of those who had pursued the streptococcal causation. It is very right that Dr. Mantle's work of nearly 50 years ago should be recalled, for it was then that some of our great clinicians were from bedside study and post-mortem evidence teaching us that acute rheumatism was probably due to infection.

I am, Sir, yours faithfully,

Bath, Sept. 21st. F. JOHN POYNTON.

PROCTALGIA FUGAX

To the Editor of THE LANCET

SIR,—In Dr. Thaysen's paper (August 3rd) and the full correspondence which it elicited I have seen no reference to epilepsy. I have noted statements in the correspondence which bring some of the cases referred to into line with that which is described below, which I believe is one of epilepsy. I have not myself observed the evidence. Dr. Thaysen wrote of one patient that the pain sometimes waked him, and ceased suddenly; of another, with associated epigastric discomfort, that he became cold and perspired; of another, with similarly associated visceral symptoms, that he fainted. Proctalgia in one of his patients followed coitus and was succeeded by fainting. He quoted two instances in which a parent and child had proctalgia. Dr. Ryle (August 10th) alluded to the incidence of the pain with sleep. Dr. Blyth (August 17th) referred to two cases in which the pain developed soon after masturbation. Dr. McEwan (Sept. 7th) wrote of associated coitus interruptus, and another correspondent referred to proctalgia in brothers, sufficient to cause unconsciousness. Lastly, Dr. Marshall (Sept. 14th) quoted a case in which he finally relieved the pain by amyl nitrite, a remedy for several states, but which the last generation of physicians relied on for the abortion of epileptic attacks.

I do not suggest that proctalgia fugax is necessarily an epileptic phenomenon, but there seem to be cases in which it is the aura and, at times, the entire epileptic manifestation. It is true that the case I now relate is my only example, but for many years I have known, from a source which I do not recall, of the reality of the rectal visceral epileptic aura.

When I first saw Mrs. B., aged 37, in April last it was rectal pain which worried her; the subsequent attacks of fainting, for which she was sent to me, bothered her much less. She did not know of the possibility of epilepsy. There was no detectable lesion at the local examination on which she insisted, and she shows no evidence otherwise of disease elsewhere. Mental failure was prominent on her father's side. She denied anal coitus. At age 6 she was taught to masturbate, and the habit persisted with regularity for the next ten years. At 10 she had a severe solitary attack of proctalgia, similar to the pain she has now. Because it occurred directly after masturbation she said nothing about it. The menses started at 11; they have continued regularly and are unrelated, in her view, to the pain or to the attacks. At 15½ she fainted on a lawn-tennis court, without clear cause. She had no associated proctalgia, but there was diarrhœa afterwards. At 16 she married, and she has several children. At 25 the proctalgia recurred after 15 years' freedom. It occurred sometimes, but only sometimes, directly after coitus. A little diarrhœa or the passage of intestinal flatus usually relieved her, but sometimes she fainted. Her husband was also concerned about this time because of attacks which clearly were petit mal. At 31 she had a more severe epileptic attack. Coitus, proctalgia, the fit occurred in rapid sequence.

The attacks of proctalgia, two or three a year, are rather more frequent than the fits. The pain wakes her. On rare occasions it has passed without a fit occurring. She describes it as horrible within the rectum, and sometimes spreading to the womb. It is never at the anal orifice. It makes her draw up her knees and roll about. Sometimes she sweats, and she knows by experience that a faint will then follow. Each attack of pain is similar to the others. There is a definite although inconstant link between coitus and the pain, and on two occasions the pain has waked her from a dream of coitus. The onset when she is not asleep is always abrupt; the pain lasts five or ten minutes, she thinks. If she has a fit she often finds the pain still present on recovery, but fading away. She has no remedy for the pain save the voidance of gas or a small motion. She elects to do this; there is no urgent call. She does this whether she has or does not have a fit, and she thinks that by doing so she has sometimes aborted a fit. Spontaneous disappearance of the pain, without this help, is very rare. She has never had an attack, save the faint at 15, without a preceding rectal pain. In July last she wrote: "I woke this morning at 2 o'clock with the same damned pain. I tried to fight the feeling of faintness, but I went dead off and on coming to felt sick and had the usual flatulence and motion. I went back to bed and must have slept a few minutes, as I woke again at 2.15 feeling very sick but without actual pain, only a wish to pass a motion. I put the chamber on the bed so as to be sick into it, and lay down and again fainted dead off. When I came round I found I had bitten my tongue and had dribbled. I passed a second very loose motion, then went back to bed and slept well."

The epileptic visceral aura, or the epileptic equivalent, which is commonly described is an epigastric sensation. I have seen no other case of rectal or anal aura nor, for that matter, have I ever met rectal crisis in tabes dorsalis. Perineal crisis has come before me once or twice. I am sure that Dr. Howard (August 10th) will not mind a suggestion that he modifies his need to make a test in each case of obscure rectal pain, so as to exclude tabes dorsalis, for we know that tests often fail, at the time they are made, to confirm this correct clinical diagnosis.

Dr. Carter's note (August 17th) interested me.

His patient had pain and other symptoms in a foot which, later on, were associated with rectal pain, although never at the same time. He wrote that a single lesion, causing pain at the two sites, provided an interesting speculative study in neurological localisation.

In February, 1933, I saw a six-year widow aged 44, with one child, who complained that for four months she had pain throughout the second and third toes of the right foot, and in these alone, directly before and during every act of defæcation. It then passed instantly. It was no more than a nuisance to her. Dilatation of the anus, from within or without, did not increase the pain. It occurred whether the fæces were solid or liquid, also with the passage of gas alone and sometimes when the toilet paper made contact. There was no pain or tenderness at or near the rectum, but bi-digital compression of the tissues between the rectum and vagina, at a certain spot, caused instant pain in the two toes. There was no detectable local disease, but she had some slight clinical evidence which suggested insular sclerosis. Her story of the pain, although unusual, was clearly genuine, and I regarded it as referred along the musculo-cutaneous nerve, but from a lesion in the lower sacral plexus.

I do not know why two toes alone were involved. She was treated, at a time the pain was present, by a large epidural injection of warm saline, made through the sacro-coccygeal ligament. The pain was relieved immediately and, save for a slight return six weeks later, with spontaneous recovery, it has never recurred. She remains well. The clinical signs which suggested spinal cord disease are unaltered. The sensory side which, objectively, was healthy remains so.—I am, Sir, yours faithfully,

Harley-street, W., Sept. 21st. HILDRED CARLILL.

T.A.B. VACCINE FOR GONORRHŒA

To the Editor of THE LANCET

SIR,—I should like to bring to the notice of my medical colleagues a form of treatment for gonorrhœa with which I have had excellent results. I am not claiming to introduce something new, as protein-shock therapy has been in vogue for some time. What I do claim is that a fresh infection of gonorrhœa can be cured within two weeks. The gonococcus, as is well known, is a delicate organism, which cannot survive at a temperature of 104° F. and above. My experiments were suggested by the observation that some patients under my charge who developed malaria had a speedier recovery from gonorrhœa than their fellow patients. The method is this:—

On admission the patient is put to bed on a milk diet and given an intravenous injection of 0·25 c.cm. T.A.B. vaccine in 5 c.cm. sterile normal saline. In about an hour he develops a typical malarial attack, the temperature usually rising to 103–105° F. The next day the patient as a rule is quite normal, but some complaint of slight headache may be made. The injections are repeated every third day, the dose of vaccine being increased by 0·25 c.cm. each time. By the third injection the patient is "dry." Three injections usually suffice; I have given four in one case only. In conjunction with these injections local irrigations are given twice daily of a weak (1 : 10,000) solution of pot. permang. and an alkaline mixture taken internally. On the day of injection no other treatment is given.

Chronic cases also do quite well on this form of treatment, but as there is usually a mixed infection the results are not so striking. The gonococci however disappear after the first or second injection. No after-effects whatever have been noted, and the treatment is quite safe and harmless.

I am, Sir, yours faithfully,

Simla, India, August 29th. A. H. BARTLEY.

THE DRUG HABIT

To the Editor of THE LANCET

SIR,—That hardy annual, the cost of medicines for insured persons, has again flowered. There appears to be no perceptible difference in this year's blooms when these are compared with those of last year, and the year before that, and the year before that, and for years and years and years, as the curate of army concert parties used to say. Surely it is time this plant exhibited some floral variation, even if only by way of a freak bloom. Is it not just possible that what that expert gardener, the late C.M.O. to the Ministry of Health, has gone on all these years regarding as a weed may actually not be a weed at all, but a plant indigenous to the English soil?

When we are told that in Scotland the cost per head of insured persons' medicine is only two-thirds the cost per head in England, let us assume that doctors here and even in Scotland know their business and give their patients not what the patient thinks he or she wants, but what the patient in the doctor's opinion needs. Any other opinion, even if it does emanate from an official of the Ministry of Health, seems to imply that practitioners disregard their obligations to provide necessary treatment. Surely here we have a fact of some importance; roughly, the Scottish population needs two-thirds the medicine the English population of the same size requires. Is there, for one thing, less prolonged illness in Scotland? If a man there takes ill with what may be his last illness, does he die more quickly? If he does, the resistance to infection of the Scottish population is considerably less than that of the English; which would imply that the standard of public health in Scotland is two-thirds that in England; and that increase of resistance due to public health measures is likely to result in increased costs of medicine because with increased resistance on the part of the population illnesses late in life are likely to last longer. Or is it that when a man takes seriously ill at the end of his life he is, in the old fashion of a century ago, "given over" by the physician, and the administration of drugs stopped? This practice, if readopted in England, would decrease the costs of drugs. Again, with a man recovering from a slight illness, it is sometimes wise to continue treatment of one kind or another for a week or so after he has resumed work. If in Scotland, or in those English areas where costs are low, treatment is stopped when the man is sent back to work, this suggests that some people may suffer unduly through the cessation of treatment too soon.

A good deal of information is obviously obtainable from these figures, once they are taken seriously as representing the real requirements of the population. I am happy in possessing a dispensing practice, and from May 1st, 1934, to April 30th, 1935, the average cost of drugs per prescription was 6·62 pence, as compared with the average cost of drugs in prescriptions dispensed by chemists of 3·677 pence for the whole country for 1934. I know the reason for the higher cost here than that in the chief part of the country. In the first place the figure 3·677 pence applies to persons living within a certain distance of a chemist—admittedly the bulk of the population, but people living and working usually under good conditions. Dispensing practices naturally cover populations scattered in small and often old cottages and working exposed to the elements; their drug costs are likely to be heavier, since this population will take ill more severely or more often

than one living under better conditions. In this district conditions are distinctly bad, even for the country. The result is a drug-cost per prescription practically twice that for urban populations; to take one example, grs. 10 or 15 of salicylate of soda are needed where I personally should use 7½ in a town.

The explanation which knowledge of actual conditions prompts for these drug figures in my individual practice is borne out by other figures. In an insured population of about 650 there were in the same period 690 panel visits and 2140 panel consultations. Taking 40 per cent. as the number of patients one may expect to see in the year, this would give 690 visits and 2140 consultations to be divided between 260 people. This is 2·65 visits and 8·23 consultations for *each* of these 260 people; or, if it assumed half were sick at home and half came to the surgery, 5·30 visits per person treated at home and 16·46 attendances at the surgery for persons treated there. The last figure is obviously too high; clearly more than 260 insured persons were treated in the year; and these figures, with a low visiting figure and a high consultation figure, show that people are doing what they should, and attending for treatment in the early stages of their illnesses. Treatment then, which means buying drugs for them, certainly lessens the severity of illness and probably lessens its duration, and may keep a man at work. If the man waits till he is too ill to work before seeking treatment the visiting figures go up and the drug figures do not go down, for it will take at least the same amount of drugs to put him right then as it would do to treat him if he seeks treatment when he should. In other words, the drug expenditure prevents a good deal of payment of sickness benefit by the approved societies.

It would be worth while to correlate the figures of sickness benefit payments in the areas where drug costs are low with those in the areas where drug costs are high; but, particular points like this apart, if I can account for my high drug costs by knowing what actual conditions here are, is it not possible that similar explanations may be available for the variations within England? Sometimes "comparable areas" are not really comparable; and I cannot remember to have seen an assessment of the whole cost of insured persons, including sickness benefit payment, for "comparable areas."

I am, Sir, yours faithfully,

C. T. NORRIS.

Manea, March, Cambs., Sept. 21st, 1935.

THE DOCTOR AS ADMINISTRATOR

To the Editor of THE LANCET

SIR,—It may be of interest to relate my practical experience in support of the view that the doctor ought to be an administrator, as this is the best way to bring full prosperity and success to any medical institution. I have held the position of not only chief physician but director of the Imperial sanatoriums in Russia. These sanatoriums covered a very big area, more than 1500 acres. There were more than a hundred buildings, including quarters for doctors, male and female nurses, and employees. We had our own church, electric station, water station, post and telegraph office, a big farm, with more than fifty cows, poultry, and so on.

Every department had its own head, but the whole administration was governed by the chief physician. Every week there was a committee meeting under the chairmanship of the chief physician in his capacity as a director. The committee consisted of the doctors, assistants, heads of all departments, secretary, treasurer, book-keeper, architect, and even a priest. Questions on all matters that cropped up were put before the committee and the opinion of everybody concerned was asked. Short discussion followed, and the final decision by the director—i.e., the chief physician—was declared and put in writing. Such matters as canalisation, purchase of a new dynamo, church furniture, plans for the new buildings, all went to the committee for final decision.

During all the years that I acted as assistant physician, chief physician and director, I cannot remember any dissatisfaction or any inefficiency. I have published a book (a copy of which may be found in the British Museum) about the administration of Imperial sanatoriums in Russia in 1913, and the conclusion is that in order to attain a high standard in medical institutions the doctor ought to be an administrator.—I am, Sir, yours faithfully,

London, Sept. 21st. B. A. PEROTT.

VACCINATION ON THE THIRD DAY

To the Editor of THE LANCET

SIR,—Dr. Paterson is very dogmatic about the harmfulness of vaccination and circumcision in the first three weeks of an infant's life. Coming as it does from an authority on children's diseases, this pronouncement is bound to influence profoundly the action of would-be circumcisors and vaccinators, with the result that many infants will be left unvaccinated and uncircumcised until the necessity for one or both has been forgotten by the person interested in the welfare of the infant. One instance is hardly enough evidence to condemn the practice. In my own experience, amounting to nearly 800 cases of circumcision and vaccination performed within ten days of each other in the first three weeks, I have never had cause for regret. The Jewish race could hardly be so well established, and increasing, if early circumcision were detrimental; their method allows an almost bloodless operation to be carried out without anæsthetic or ligatures, an advantage that cannot be enjoyed by infants of riper months. In a similar way, vaccination performed during the first month (taking for granted that only one scarification is made) has the double advantage of a painless procedure and efficient care by the monthly nurse before she leaves the infant to the care of a nanny.

I am, Sir, yours faithfully,

AUBREY GOODWIN.

Queen Anne-street, W., Sept. 19th.

AMOUNT OF HÆMOGLOBIN IN THE BLOOD

To the Editor of THE LANCET

SIR,—The paper from the medical unit at the London Hospital in your issue of Sept. 21st will be most valuable to hæmatologists. I have been for some time endeavouring to find a method of determining the percentage of hæmoglobin that can be used by the general practitioner at the bedside. For this purpose dilution methods are seldom practicable, and it is important that the observations shall be made on fresh blood.

The Dare apparatus has the disadvantage that the graduation of the scale is much too steep. Furthermore, it is originally expensive; replacement of parts is even more so, and they have to be obtained from America. The chief difficulty about the Tallqvist method, which is clinically convenient, lies in the fact that there is a considerable difference in the *tint* of different scales, some being too blue and others too yellow. If however the comparison with the blood

is made through a piece of green glass, the observer having his back to the window or a domestic electric bulb and holding the glass close to his eye, the difference in tint is substantially eliminated and the reading can be made, as it should be, by *tone* only.

I have experimented with many shades of glass and numerous Tallqvist scales. In the result a particular shade of green was selected which answered the purpose, especially in counteracting the aforesaid differences between the scales. It is put up in a convenient frame by the Hospital Contracts Co. (33, Mortimer-street, London, W.1) with a leather cover, and can be carried in the waistcoat pocket.

It is not suggested that by this means an absolute determination of the hæmoglobin content can be made, but it is sufficiently accurate for comparative observations in the same patient which are necessary for estimating the value of treatment.

I am, Sir, yours faithfully,

A. KNYVETT GORDON.

Bedford-square, W.C., Sept. 23rd.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. G. H. Hayes to *Pembroke* for R.N.B., temp., and to *Pembroke* for R.M. Infirmary, Chatham; S. G. Rainsford to *Pembroke* for R.N.B.; and W. F. Beattie to *Victory* for R.N.B.

The following officers qualified at the examination for promotion to surgeon commander held recently: Surg. Lt.-Comdrs. W. G. C. Fitzpatrick and W. A. Hopkins (qualified for accelerated promotion), M. Barton, F. B. Quinn, J. J. Cusack, and C. R. Roland.

Surg. Lt. S. Jenkinson promoted to rank of Surg. Lt.-Comdr.

Surg. Lt. J. W. Oliver to *Pembroke* for R.N. Hospital, Gt. Yarmouth.

The following have received appointments as surgeon lieutenants, R.N., for short service: J. Carlton, London University and Guy's Hospital; J. M. Fitzpatrick, Royal College of Surgeons, Ireland; A. E. Ginn, Guy's Hospital; G. S. Grist, Oxford University and St. Mary's Hospital; N. S. Hepburn, Edinburgh University; F. H. Lamb, St. Thomas's Hospital; J. Lees, Cambridge University and St. Thomas's Hospital; D. Shute, Victoria University of Manchester; H. G. Silvester, University College Hospital; D. Simpson, Liverpool University; J. L. S. Steele-Perkins, Royal College of Surgeons, Edinburgh; and W. F. Viret, Leeds University.

ROYAL NAVAL VOLUNTEER RESERVE

W. J. Heely entered as Proby. Surg. Lt. and attached to List 2 of the Severn Division.

ROYAL ARMY MEDICAL CORPS

Lt.-Col. C. E. L. Harding, having attained the age for retirement, is placed on ret. pay.

Maj. S. M. Hattersley, M.C., to be Lt.-Col.

Royal Hospital, Chelsea.—Lt.-Col. H. C. D. Rankin, O.B.E., relinquishes the appt. of Physician and Surgeon.

Maj. C. Armstrong, M.B.E., to be Physician and Surgeon.

SUPPLEMENTARY RESERVE OF OFFICERS

Lt. J. Morgan to be Capt.

ARMY DENTAL CORPS

Capt. A. H. Kay is retired under the provisions of Art. 149, Royal Warrant for Pay and Promotion, 1931, receiving a gratuity.

MILITIA

Maj. T. W. E. Elliott retires on attaining the age limit and retains the rank of Maj.

TERRITORIAL ARMY

Capt. W. T. de V. Thomson resigns his commn.

Lt. T. A. S. Kennerley to be Capt.

ROYAL AIR FORCE

Flight Lt. A. E. Vawser to R.A.F. Depôt, Uxbridge.

The following Flying Offrs. are posted to Medical Training Depôt, Halton, on Sept. 2nd, on appointment to Short Service Commissions: A. S. Amsden, H. E. Bellringer, J. P. Carlile, C. M. Carlyle-Gall, W. J. L. Dean, T. J. M. Gregg, R. S. B. McClean, A. B. Marshall, S. R. C. Nelson, R. S. Peill, R. L. Soper, L. N. Trethowan, and J. B. Wallace.

Dental Branch.—Flying Offr. D. P. Boyle to Medical Training Depôt, Halton, on entry into R.A.F., on a non-permanent commission.

INDIAN MEDICAL SERVICE

Capts. to be Majs. (provl.): G. P. F. Bowers, J. S. Riddle, J. E. Gray, S. Smyth, and M. H. Wace.

Capt. J. M. Matthew resigns his commn.

Lt. F. W. Whiteman to be Capt.

Abdul Aziz Khan to be Lt. (temp. commn.).

Col. H. E. Stanger-Leathes, K.H.S., retires.

DEATHS IN THE SERVICES

The death occurred on Sept. 22nd at Harrogate of Surg. Vice-Admiral Sir JOSEPH CHAMBERS, K.C.B. He was born in 1864, the son of Thomas Chambers, J.P., of Bailieborough, Co. Cavan, was educated at Trinity College, Dublin, and qualified M.B., B.Ch. in 1887. He entered the Royal Navy as surgeon in 1889, served in the South African War, and was in charge of several naval hospitals. During the European War he was operating surgeon at the Royal Naval Hospital, Chatham, and was created C.M.G. in 1919. In the following year he was appointed surgeon rear-admiral, in 1922 he was given charge of the Royal Naval Hospital, Plymouth, and in 1923 he succeeded Sir Robert Hill as director-general of the Medical Department of the Navy with the rank of surgeon vice-admiral, retiring in 1927. He received the C.B. (Mil.) in 1923 and was created K.C.B. in 1926, the year after he had been appointed hon. physician to the King. In 1924 he was admitted an Honorary Fellow of the Royal College of Physicians of Ireland and an Honorary M.D. of the University of Dublin. He married in 1908 Irene, daughter of Mr. R. C. Tanner, of Chester.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 14TH, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2162; diphtheria, 1151; enteric fever, 59; acute pneumonia (primary or influenzal), 342; puerperal fever, 42; puerperal pyrexia, 102; cerebro-spinal fever, 11; acute poliomyelitis, 22; polio-encephalitis, 2; encephalitis lethargica, 3; continued fever, 1 (Leeds); dysentery, 18; ophthalmia neonatorum, 70. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Sept. 20th was 2675, which included: Scarlet fever, 838; diphtheria, 960; measles, 35; whooping-cough, 375; puerperal fever, 29 mothers (plus 12 babies); encephalitis lethargica, 271; poliomyelitis, 15. At St. Margaret's Hospital there were 17 babies (plus 4 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox or enteric fever, 6 (0) from measles, 2 (0) from scarlet fever, 13 (1) from whooping-cough, 29 (2) from diphtheria, 63 (8) from diarrhœa and enteritis under two years, and 14 (3) from influenza. The figures in parentheses are those for London itself.

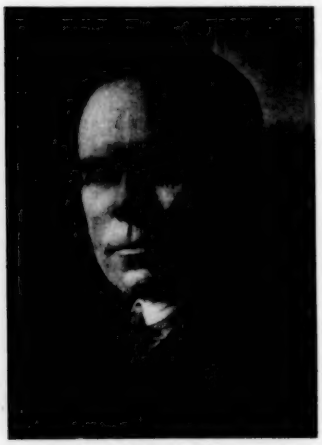
Deaths from diarrhœa and enteritis were distributed over 22 great towns, the highest numbers being Liverpool 18, Sunderland and Birmingham each 5, Gateshead 3, no other great town more than 2. Bristol reported 2 deaths from measles. Leeds and Sheffield each reported 2 deaths from whooping-cough. The fatal cases of diphtheria were distributed over 22 great towns, Birmingham reporting 3, Bradford, Hull, Sunderland, and Norwich each 2.

The number of stillbirths notified during the week was 272 (corresponding to a rate of 42 per 1000 total births), including 39 in London.

OBITUARY

WILLIAM DUNCAN, O.B.E., M.B. Glasg.

Dr. Duncan, whose death on Sept. 15th was briefly recorded in our last issue, had been for 15 years attached to the insurance medical service and for two years a senior medical officer in the Ministry of Health. He was born at Cumnoch, Ayrshire, in May, 1872, went to school at Ayr Academy, and took his professional training in Glasgow University, where after winning many academic distinctions he took the M.B., C.M. in 1897, being the prizeman in medicine of his year. In the following year he began general practice at Clay Cross, Derbyshire, and soon established a reputation as a clinician of outstanding ability. But the work of his practice, exacting as it was, formed only one outlet for his fund of energy. He threw himself with enthusiasm into the public affairs of the area, becoming medical officer of health for the Clay Cross urban district, certifying factory surgeon, and a member of the Derbyshire County Council. In these capacities he gained experience in the discharge of public duties which stood him in good stead in later years during his career as an officer of the central government. With his colleagues in South Derbyshire he was popular and influential; his counsel was sought and trusted; and he did much to foster a sense of collective professional responsibility. For some years he was secretary of the Chesterfield division of the British Medical Association, which he represented at the annual meetings, and he was one of the original members of the Derbyshire Insurance Committee. In 1912 he was called to the bar at the Middle Temple, winning the J. G. Powell prize in common law. He was keenly interested in the Territorial Force, which he joined in 1907, and when at the outbreak of the war he was mobilised with the 2–6 Sherwood Foresters his career as a general practitioner came to an end. Throughout the war he served with distinction.



[*Photograph by Keith Dannatt*

DR. WILLIAM DUNCAN

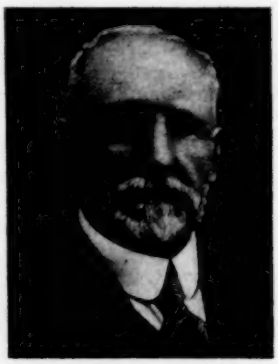
On leaving the army in 1919 Duncan was decorated O.B.E. and was appointed to the medical staff of the Ministry of Pensions as staff deputy commissioner in the London region. His reserve of energy and ability soon made him a marked man. As one of his superior officers remarked: "It doesn't matter how difficult may be the job you give to Duncan, you can depend upon his doing it as well as it can be done." In 1920 he joined the newly constituted regional medical staff of the Ministry of Health, becoming one of the original regional medical officers. It was evident from the first that he was destined for advancement; in 1928 he was promoted to succeed Dr. H. J. Neilson as divisional medical officer of the south-western division, and in 1933 on the retirement of Sir James Smith Whitaker he became the senior medical officer of the Ministry in charge of general practitioner services. He had hardly entered upon his new duties when he was attacked by the illness to which he ultimately succumbed, and during his last two years of life he was seldom free from pain.

Duncan was a man of exceptional energy and driving force. Difficulties had a way of vanishing before his determined attack. If information had to be got he could be relied upon to get it; if an awkward situation had to be adjusted he could adjust it. He was imbued with an idealism which was probably the chief source of his dynamic qualities. Vigorous, always good tempered, in love with his work, touching life at many points, and gifted with an immense capacity for enjoyment, he was a source of inspiration to many. He faced the long tragedy of his last illness with a smiling serenity, a cheerful acquiescence in the premature ending of his career at the zenith of his powers, that recalled his fellow-countryman, R. L. Stevenson, with whom he had not a little in common. His death has deprived the State of an officer of exceptional capacity for public service, and his colleagues past and present of a much valued friend.

Dr. Duncan was twice married, and leaves two grown-up children by his first wife. In August, 1919, he married Christina Smith, who survives him.

JOHN TRIMBLE ELLIOTT, L.R.C.P. Edin.

THE sudden death of Dr. Elliott, of Smithborough, on Sept. 9th, has caused sorrow throughout the medical profession in Co. Monaghan and other parts of Northern Ireland where he was a well-known figure. The eldest son of the late Rev. John Elliott of Armagh, he studied at the Queen's Colleges of Belfast and Galway, where he had a distinguished career, taking his qualifying diplomas at Edinburgh in 1881. After graduation he held for a year the post of resident surgeon to the Derry Infirmary, and was then appointed dispensary medical officer and M.O.H. to the Kilmore district of Co. Monaghan, a post which he still held at the time of his death. His advice in professional matters was sound and freely given; he was on the council of the Irish Medical Association and for nearly half a century acted as secretary to the county medical association. Some years ago he took an active part in ventilating the question of the standard of the dispensary medical officers in the county; these efforts were successful, and in 1930 his colleagues marked their appreciation of his services by an address and presentation. During fifty-three years of practice in the Kilmore district, Dr. Elliott set an example of the best type of family physician of the old school. He had a kindly personality and a rare



DR. ELLIOTT

gift of homeliness that brought him into close touch with his patients. Though advanced in years at the time of his death, he was engaged in full practice and had lost little of his vigour and intellect. He was himself willing to admit that there were many new and strange things in the practice of medicine; his colleagues felt that these were matters of little practical consequence beside his remarkable breadth of judgment and foresight. Dr. Elliott took no part in politics; his interest was in the social life of the people, who honoured him with the same affection and respect as did his medical colleagues.

MEDICAL NEWS

Utilisation of the Laboratory in Medicine

A four-weeks' course of 32 lecture-demonstrations will begin on Nov. 4th in the department of pathology of the British Postgraduate Medical School provided a sufficient number of students desire to attend. The class will meet from 3 P.M. to 5.30 P.M. every afternoon, with half an hour's interval for tea at 4, and on Saturday mornings from 10 A.M. to 12 noon. The course will exemplify the utilisation of the laboratory in medicine and will consist of lecture-demonstrations on clinical bacteriology and immunology by Dr. A. A. Miles, hæmatology and clinical pathology by Dr. Janet Vaughan, and chemical pathology by Mr. Earl King, D.Sc. The detailed syllabus will be found in our advertisement columns. Application should be made to the dean at the British Postgraduate Medical School, Ducane-road, Shepherd's Bush, W.12.

University of Durham College of Medicine

The inaugural address of the winter session will be given by Sir George Newman on Thursday, Oct. 10th, at 4.15 P.M.

Pharmaceutical Society of Great Britain

On Wednesday, Oct. 2nd, at 3 P.M., Sir Gowland Hopkins, P.R.S., will give the inaugural address of the ninety-fourth session of the school, at the house of the society, 17, Bloomsbury-square, London, W.C.

Royal Dental Hospital of London

The prize distribution and conversazione will take place at this hospital on Friday, Oct. 4th, at 8 P.M., when Sir Francis Dyke Acland will preside.

Royal Institute of Public Health

The Harben lectures of this institute will be delivered at 28, Portland-place, London, W., on Oct. 14th, 15th, and 16th at 4 P.M. by Dr. P. Armand-Delille, physician to the Hôpital des Enfants Malades, Paris. He has chosen as his subject problems of nutrition and growth, and he will speak in English.

Housing Act, 1935

Lord Balfour of Burleigh will preside at a discussion on this Act, which will take place at the Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W., on Tuesday, Oct. 8th, at 5.30 P.M. Dr. James Fenton, the medical officer of health for Kensington, and Mr. J. S. Wheeler, the housing inspector of Kensington, will open the discussion.

St. Paul's Hospital, London

A post-graduate course in urology will be given at this hospital (Endell-street, W.C.) on Wednesdays at 4.30 P.M., from Oct. 16th to Nov. 27th. Mr. H. P. Winsbury-White will give the first lecture on the ætiology of urinary calculus. Other lecturers will include Mr. W. K. Irwin, Mr. Claude Mills, Mr. Kenneth Walker, Mr. Stanford Cade, Mr. Jocelyn Swan, and Dr. H. N. Webber. The titles of the lectures, which are open to all medical practitioners, will be announced week by week in our Medical Diary.

Neurological Research in Leningrad

The Leningrad Institute of Post-graduate Medical Studies has founded a department of pathology and physiology of the higher centres of the nervous system, dedicated to Prof. I. P. Pavlov, who presided at the International Physiological Congress recently held in Moscow. The director of studies will be Dr. M. K. Petrova, one of Pavlov's pupils and collaborators. The purpose of the new department is to enable students to study various forms of artificially conditioned neurosis by animal experiment, with a view to applying the knowledge gained to the treatment of human patients.

Colonel George Alexander Troup, T.D., M.D., has been appointed a deputy-lieutenant of the County of Essex.

London Hospital Medical College

On Thursday, Oct. 17th, at 4.15 P.M., Prof. William Bulloch, F.R.S., will deliver the Schorstein lecture on Medical Periodical Literature.

An award of the Liddle triennial prize will shortly be made for the best essay on relations of pregnancy to diseases of the kidney, excluding infections of the renal tract. Further particulars will be found in our advertisement columns.

Preventive Aspects of Infectious Disease in Childhood

Dr. Alison Glover will deliver four lectures on this subject on Oct. 1st, 2nd, 3rd, and 4th at 6 P.M. at Gresham College, Basinghall-street, London, E.C.

Welsh National School of Medicine

Sir George Newman will speak on The New Purpose of Medicine when he delivers the inaugural address of the winter session of this school at the Institute of Physiology, Newport-road, Cardiff, on Tuesday, Oct. 8th at 5 P.M.

Central London Throat, Nose and Ear Hospital

On Friday, Oct. 11th, at 4 P.M., Mr. A. Brown Kelly, consulting surgeon for diseases of throat and nose to the Victoria Infirmary, Glasgow, will deliver the annual address at this hospital on The Œsophagus in Young Children: Some Anatomical and Clinical Observations.

Food Poisoning at Swansea

Investigation into the cause of this outbreak is not yet complete, but a bacillus of salmonella strain has been isolated from various sandwiches eaten by the children and from their excreta. All the children affected are making good progress; there have been no deaths.

Marie Curie Hospital

A small reception was held at this hospital on Tuesday, Sept. 17th, to inaugurate the new diagnostic X ray apparatus which was the gift of Miss Edith Stoney in memory of her sister, Dr. Florence Stoney, a pioneer radiologist.

Newquay Hospital

Since this hospital was opened five years ago a new operating theatre has been built and an X ray plant installed. Now a hostel for nurses has been opened and work is to be begun at once on a further extension which will include waiting-rooms, dispensary, and offices.

Sevenoaks Children's Hospital

This hospital for the treatment of hip disease, on behalf of which no special appeal has been issued for many years, now urgently needs £2000. Mr. E. W. Meyerstein has started the subscription list with a gift of £500.

Kettering General Hospital

A sum of £5000 has been offered to this hospital by Mr. Alan Timpson to form the nucleus of a building fund. It is only 13 months since extensions costing £14,000 were opened, but already further improvements, including a new out-patients' department, are urgently needed.

Manchester Royal Infirmary

Plans for the erection of a four-story building to accommodate 100 paying patients have been passed by Manchester corporation town-planning committee. It is anticipated that fees will be from four to ten guineas a week. The cheapest rates will be for rooms containing four beds, and it is anticipated that more than half the beds will be available at a cost not exceeding six guineas a week. The sum of £100,000 has been raised recently for this hospital.

Appointments

BARBER, W. CARLISLE, M.B. Camb., F.R.C.S. Eng., has been appointed Resident Medical Officer at the Bolingbroke Hospital, London.

DODDS, GLADYS H., M.D. Edin., D.P.H., M.C.O.G., Fourth Antenatal Medical Officer to Queen Charlotte's Maternity Hospital.

MACLEOD, D. H., M.S. Lond., F.R.C.S. Eng., M.C.O.G., Obstetric Surgeon to Out-patients to Queen Charlotte's Maternity Hospital.

London County Council Hospital Staff.—The following appointments, promotions, and transfers are announced. A.M.O. (I.) and (II.) = Assistant Medical Officer, Grades I. and II.:—
NATTRASS, R. H., M.B. Melb., M.C.O.G., D.G.O., A.M.O. (I.), Mile End.
JACOBS, A. L., B.M. Oxon., A.M.O. (II.), Paddington.
EVANS, J. C. G., M.B. Lond., House Physician, Dulwich.
SCHABORT, J. W., M.B., House Surgeon, St. Mary Abbots.
PASMORE, H. S., M.B., House Surgeon, St. Mary Abbots.
GREEN, R. D., M.B., House Physician, St. Mary Abbots.
BEADNELL, L. M. M., M.R.C.S. Eng., House Physician, St. Luke's (Chelsea).
KAUNTZE, R., B.A. Camb., M.R.C.S. Eng., House Physician, St. James'.
FLATLEY, G. D., M.B. Belf., A.M.O. (I.), Paddington.
CAHILL, J. T., B.Sc., M.R.C.S. Eng., Senior A.M.O. (II.), Holborn and Finsbury Institution.
BUGGLE, C. H., L.R.C.P. Irel., A.M.O. (II.), City of London Institution.

Certifying Surgeons under the Factory and Workshop Acts: Dr. J. C. R. MORGAN (Llantrisant District, Glamorgan); Dr. C. K. SCONCE (Chester District, Cheshire); Dr. E. E. CANDLISH (Linlithgow District, West Lothian); Dr. H. P. CAITHNESS (Rothes District, Morayshire); Dr. J. GIBSON (Milborne Port District, Somerset); Dr. W. H. REYNOLDS (Caerleon District, Monmouth); Dr. A. W. MCCULLOCH (Troon District, Ayr).

Medical Referee under the Workmen's Compensation Act, 1925: Dr. F. M. R. WALSHE to be a Medical Referee under the above Act for all County Courts at present comprised in Circuits 34, 37 to 48, 51, 56, and the Mayor's and City of London Court, with a view to his dealing in particular with cases of writer's cramp and telegraphist's cramp, in place of Dr. Theodore Thompson (deceased).

Vacancies

For further information refer to the advertisement columns

Barbados General Hospital.—Jun. Res. Surgeon. £325.
Belgrave Hospital for Children, Clapham-road, S.W.—Two H.P.'s. and H.S. Each at rate of £100. Also Hon. Radiologist.
Birmingham City.—Asst. M.O. £550.
Birmingham and Midland Eye Hospital.—H.S. At rate of £130.
Birmingham, West Heath Sanatorium.—Res. Asst. M.O. At rate of £250.
Blackburn, Queen's Park Hospital and Institution.—Res. Jun. Asst. M.O. At rate of £150–£200.
Brighton, Royal Sussex County Hospital.—H.S. £150.
Cancer Hospital, Fulham-road, S.W.—Surgical Registrar.
Cardiff, University College of South Wales and Monmouthshire.—Temp. Demonstrator and Tutor. £300.
Central Middlesex County Hospital.—Med. Supt. £1300.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.
Connaught Hospital, Walthamstow, E.—Cas. O. Also H.P. Each at rate of £100.
Croydon Mental Hospital, Upper Warlingham.—Asst. M.O. £350.
Derbyshire.—M.O.H. and M.O. to Joint Hospital Committee. £800.
Derbyshire County Sanatorium.—Jun. Res. Asst. M.O. £350.
Dewsbury and District General Infirmary.—Second H.S. £150.
Durham, Sherburn Hospital.—Res. Asst. M.O. £200.
East Ham Memorial Hospital, Shrewsbury-road, E.—H.S. to Spec. Depts. and Cas. O. At rate of £120.
Grantham Hospital.—Res. M.O. At rate of £200.
Great Yarmouth General Hospital.—H.S. £140.
Grocers' Company, Grocers' Hall, E.C.—Three Scholarships. Each £300.
Harrogate and District General Hospital.—H.P. and Cas. O. At rate of £150.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—Res. Surg. O. and Asst. Res. M.O. Each at rate of £150. Also H.P.'s. Each at rate of £50.
Infants Hospital, Vincent-square, Westminster.—H.P. At rate of £75.
Ipswich, East Suffolk and Ipswich Hospital.—Consulting Physician. Also Res. Surg. Officer. £400.
Isleworth, West Middlesex County Hospital.—Asst. M.O.'s. Each £400.
King Edward Memorial Hospital, Ealing.—Jun. Res. M.O. At rate of £150.
L.C.C.—Asst. M.O. for White Oak Hospital, Swanley. £350.
L.C.C. Special Hospitals Service.—Sen. Asst. M.O.'s. Each £500. Asst. M.O.'s. Each £350. Also Asst. M.O.'s. £250.
Leamington Spa, Warneford General Hospital.—Res. H.P. At rate of £150.
Leeds General Infirmary.—Res. M.O. £200.
Leeds University, Faculty of Medicine.—Second Surgical Tutor. £400.
Liverpool, Broadgreen Sanatorium.—Sen. Res. Asst. M.O. £400.
London Homœopathic Hospital, Great Ormond-street, W.C.—Gynæcological H.S. At rate of £100.
London Hospital, E.—Surg. First Asst. and Reg. £300.
London Hospital Medical College, E.—Liddle Triennial Prize. £120.
London Jewish Hospital, Stepney Green, E.—Second Hon. Asst. Ophth. Surgeon.
London Lock Hospital, 283, Harrow-road, W.—Res. M.O. for Male Depts. Also Surgical Reg. for Female Lock Hospital. At rate of £175 and £100 respectively.
Macclesfield General Infirmary.—Sen. H.S. £180.
Manchester, Booth Hall Hospital.—Jun. Asst. M.O. At rate of £200.
Manchester Royal Children's Hospital, Pendlebury.—Res. Surg. O. At rate of £125.
Metropolitan Hospital, Kingsland-road, E.—Sen. and Jun. H.P.'s and H.S.'s. Also Cas. O. Each at rate of £100.
Northampton General Hospital.—H.S. to Ear, Nose, and Throat Dept. At rate of £150.
Nottingham General Hospital.—H.S. for Ear, Nose, and Throat Dept. At rate of £150.
Nottingham Hospital for Women.—H.S. At rate of £150.
Paddington Green Children's Hospital, W.—H.P. and H.S. Each £150.
Plymouth, Prince of Wales's Hospital, Greenbank-road.—Res. Anæsthetist and H.S. to Spec. Depts. At rate of £120.
Queen Mary's Hospital for the East End, E.—Asst. Pathologist. £400.
Queen's Hospital for Children, Hackney-road, E.—Asst. Physician.
Richmond Royal Hospital.—Jun. H.S. At rate of £100.
Romford, Oldchurch Hospital.—Jun. Res. M.O. £250.
Royal Air Force Medical Service.—Commissions.
Royal Eye Hospital, Med. School, St. George's-circus, S.E.—Research Scholarship. £100.
Royal Free Hospital, Gray's Inn-road, W.C.—Res. Anæsthetist Reg. £100. Also Res. Cas. O. At rate of £150.
Royal Masonic Hospital, Ravenscourt Park, W.—Res. Surg. O. At rate of £250.
Royal National Orthopædic Hospital, Great Portland-st., W.—Two Registrars. Each £105.
St. Albans and Mid Herts Hospital and Dispensary.—Res. H.S. £150.
St. John's Hospital, Lewisham, S.E.—Res. H.P., Res. H.S. Also Res. Cas. O. Each at rate of £100.
St. Margaret's Hospital, Leighton-road, Kentish Town, N.W.—Visiting M.O. £200.
St. Mary's Hospital for Women and Children, Plaistow, E.—Resident and Asst. Res. M.O.'s. At rate of £175 and £120 respectively.
Salop County Council.—Assist. M.O. £500.
Shrewsbury Royal Salop Infirmary.—Res. Surg. O. £250. Also Res. H.S. and Res. H.P. Each at rate of £160.
Southend-on-Sea General Hospital.—Pathologist. £600. Also Hon. Visiting General Physician and Surgeon.
Sutton, Surrey, Downs Hospital for Children.—Asst. M.O. £350.
Westminster Hospital Annexe, 66, Fitzjohn's-avenue, Hampstead. Res. M.O. £200.
Willesden General Hospital, Harlesden-road, N.W.—Physio-Therapeutist. £75. Also Hon. Physician.
Worcester Royal Infirmary.—Hon. Physician.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Howden (York, E. Riding).

Births, Marriages, and Deaths

BIRTHS

BROOKS.—On Sept. 16th, at Sutherland-avenue, N.W., the wife of W. D. W. Brooks, B.M. Oxon., M.R.C.P. Lond., of a son.

COLEMAN.—On Sept. 18th, at Croydon, the wife of Albert Coleman, M.B. Manch., M.R.C.P. Lond., of a daughter.

HALL.—On Sept. 15th, at Cromwell-road, S.W., the wife of James Hall, M.B. Camb., of Maldon, Essex, of a son.

MUIR.—On Sept. 17th, at Hull, the wife of David Clark Muir, M.D., F.R.C.P. Lond., of a son.

STAMP.—On Sept. 18th, at Rivermead-court, Hurlingham, S.W., the wife of Trevor C. Stamp, B.Ch., of a son.

WALKER.—On Sept. 15th, Elizabeth K. Walker, M.B. Edin., the wife of Cecil Walker, Parkstone, Dorset, of a son.

MARRIAGES

PATON—BACON.—On Sept. 14th, at St. Mary's Church, Denham, Ian A. M. Paton, M.B. Edin., to Madelene, elder daughter of Mr. and Mrs. Francis Bacon, of Denham, Bucks.

SARGEAUNT—BUCK.—On Sept. 21st, in London, William A. Sargeaunt to Helen R. Buck, M.B. Lond.

WEBB—PEARSON.—On Sept. 14th, at Christ Church, Crouch End, C. H. Shorney Webb, M.S. Lond., F.R.C.S. Eng., to Norah Aimée, eldest daughter of Mr. and Mrs. A. M. Pearson, of Fleetwood, Lancs.

DEATHS

BATHURST.—On Sept. 17th, at Dorking, William Henry Bathurst, M.D. Durh.

FLIGG.—On Sept. 14th, at Weston-super-Mare, William Fligg, M.B. Edin., of Bishop's Lydeard.

GRIFFITHS.—On Sept. 21st, at Llandrindod Wells, William Layard Griffiths, M.D. Lond., F.R.C.S. Eng., of Swansea, aged 64.

RICHARDSON.—On Sept. 16th, Arthur Haden Richardson, F.R.C.S. Eng., Kingswinford, near Dudley.

WEEKES.—On Sept. 20th, suddenly, at Boscombe, Charles Peterson Weekes, F.R.C.S. Edin., formerly of Southampton.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

FURTHER STEPS TOWARDS SLAVERY

By T. Izod Bennett, M.D., F.R.C.P. Lond.

Whether the increasing mechanisation of the so-called civilised world is a transient or a permanent phenomenon, it cannot be questioned that it makes or should make the medical man a more and more important personage as a counsellor to the State. Diet and nutrition have become questions of major importance in countries where the majority of the inhabitants are so dependent on minimum wages or doles that the cost of food on the one hand bears a direct relation to the number of visits they can pay to the cinema, and on the other hand to the prosperity of the agricultural classes. The increasing interest in dietetics is reflected equally brightly but from an entirely different angle in the numbers of books on the subject issued from publishing houses who make their appeal sometimes to those who are known as food faddists, by which is meant persons who seek cures for all illnesses in eccentric dietaries, and on the other hand to that new school of gourmets who rise in revolt against standardised food and the modern catering establishment. An ever-growing audience hangs on the words of a numerous group of hospital dietitians who are applying a partially digested knowledge of calories and the constituents of the vitamin-B complex to the problems of suitable menus for the sick, whether as individuals or as groups.

CHEMISTRY IN AGRICULTURE

The historian who surveys the economic world crisis which surrounds us to-day may well devote a considerable proportion of his time to the nutritional problems which this crisis has aroused and from which also, to some extent, it appears to have arisen. For it cannot be doubted that two facts are of enormous importance in determining the present condition of the civilised world. The first of these facts is that the application of chemistry to the production of food has reduced the cost of such necessities of life so greatly that the agricultural community is faced with ruin in nearly every land, whilst the same scientific processes make it possible to multiply the productivity of a given area of land by an enormous amount; or, in other words, to reduce enormously the area of arable land necessary to provide food for any given community. Recent American estimates state that in 1790 90 per cent. of the population there were engaged in agriculture; in 1930 the ratio had fallen to 20 per cent., and it is estimated by the United States Department of Agriculture that the men now engaged in agriculture in that country could be reduced to half their present number and produce considerably more than the existing amount of food if relatively simple methods for increasing the efficiency of farming were adopted. One American expert goes so far as to say that at the present time it would be relatively easy to eliminate four out of five farmers and four out of five acres of cultivation if the most scientific methods of farming were immediately to be put into action.

THE RARITY OF STARVATION

The second great fact relating to nutrition in the present economic crisis is that with all the disorganisation and suffering which has affected this country, France, Germany, Italy, Spain, the United States of America, and all the other great countries of the world, there have been practically no deaths from starvation. Even in the last year of the world war and the year immediately following it, starvation was not a common event in any country, although nutritional disorders were extremely frequent. The choice of a diet was a privilege withdrawn from all but extremely few, but a diet sufficient to prevent starvation was almost always obtainable even though it may have been inadequate from many points of view. In the present economic crisis the restriction as to choice has been much less marked, and the ill-effects of restriction have been even less frequent.

It is exceedingly difficult to submit these facts, much less to discuss them, without exciting violent controversy. Prof. L. S. P. Davidson and his associates at the University of Aberdeen have recently published [1] a further report on their investigation into the iron deficiencies found amongst people of the poorest classes in Aberdeen and the north east of Scotland. Amongst 3500 individuals of both classes and all ages they found anæmia to be present in 41 per cent. of infants under the age of 2 years, in 32 per cent. of pre-school children, in 16 per cent. of adolescent women, and in 45 per cent. of adult women. Comment on this fact will depend largely on the political views of the reader; on the one hand he may claim that they prove the necessity for a political revolution, on the other hand he may be more impressed by the fact that all this nutritional anæmia could be abolished by the distribution to the population of an amount of iron salts costing a fraction of a penny per week per family. But whatever comment were aroused it would seem that the answer would point towards increased mechanisation, for he is a bold and usually an ignorant man, who in the days of nitrogen fixation, artificial fertilisers, synthetic silk and synthetic rubber, continues to cry "Back to the Land."

THE VALUE OF SYNTHETIC FOODS

The present year saw, at Cornell University, the killing of the first two synthetic sheep. These creatures, taken from their dams in the first few days of life, were brought up on a diet composed exclusively of synthetic substances, protein, carbohydrate, fat, concentrated vitamins, and salts; not only were they well grown and bearing a wool of high quality, but they were free from many of the parasites common to the normal sheep. The last two decades have been marked by constant warnings from our profession as to the dangers of diseases which must follow the increased artificiality of the people's food. The time has perhaps come to admit that these warnings have not been justified. Just as it took the margarine manufacturers very few months to add to their product those missing elements which made it inferior to butter as a food, so in other directions the manufacturer has little difficulty either in improving the nutritional value of his products or in supplying a chemical factor of greater value in the treatment of disease than a natural factor present in food. It is true that insulin is still made from animal tissues and that thyroideum is extracted from the natural gland, but the treatment of pernicious anæmia by liver and liver extracts has become of lesser importance than the use of hypodermic and intramuscular agents derived from the laboratories.

THE SPACING OF MEALS

Nevertheless the potential value of the medical man as an adviser concerning dietetics and nutrition becomes enhanced rather than diminished. A thousand and one problems concerning food remain to be solved. An illustration of this is to be found in a recent investigation by H. W. Haggard and L. A. Greenberg [2] of the Department of Applied Physiology in the University of Yale. These workers have directed their attention not so much to the total quantity and quality of food as to the importance of the spacing of meals throughout the twenty-four hours. In a very full investigation they have found that factory workers in the United States show a well-marked variation in physical efficiency at different periods of the working day. They have

[1] Brit. Med. Jour., 1935, ii., 195.
[2] Diet and Physical Efficiency. London: Humphrey Milford, Oxford University Press. 1935.

further found that this variation in efficiency is closely correlated to the concentration of sugar in the blood when this is estimated at regular intervals in such workers, and that it is still more closely correlated with the changes in the respiratory quotient during the same time. When these variations are more closely examined it is found that the efficiency, the respiratory quotient, and the blood-sugar are all at their lowest either in the early morning hours when work is being done after a meagre breakfast, or at periods so long after the mid-day meal that the minor features of hunger are beginning to make their appearance. By increasing the number of meals from three to five, without making any increase in the total amount of food ingested, they were able to increase the physical efficiency of factory workers by a very definite amount as gauged by output. The two additional meals were given in the middle of the morning and the middle of the afternoon, and consisted of milk and cake, it being found that carbohydrate food, as the observations on the respiratory quotient and blood-sugar suggest, was essentially the factor necessary to improve physical efficiency.

What general conclusion is to be drawn from this work? If the reader is the owner of a factory devoted to the mass production of tennis shoes the answer is perhaps easy, but if he follows a different calling it becomes very much more difficult. Perhaps an answer may be supplied by the first and last pages of Haggard and Greenberg's book. On the first page it is written—"breakfast is now generally a light meal; but it is so largely because an elaborate breakfast requires that someone should get up early to prepare it, and service in America now is at a minimum. Again, in most American households, the evening dinner is eaten fairly early; otherwise someone would have to work late to wash dishes." On one of the last pages we read, as to the habits of the subjects under investigation, "all were ignorant of the requirements of nutrition; all ate what appetite or momentary availability dictated. We found one woman who subsisted almost entirely upon cheese sandwiches and candy, another whose diet was at least two-thirds ice-cream sodas, and still another who ate little but bread and jam and coffee."

Perhaps these quotations justify the heading of this article. It is clear that if these American workpeople were given a slice of cake and a glass of milk in the middle of the morning and the middle of the afternoon they would produce more tennis shoes, and physicians versed in the difficulties of treating cases of peptic ulcer will immediately recognise that the suggested change of diet would be an immense benefit to any workpeople having a tendency to this disease; but does the community require more tennis shoes, should the healthy man's diet be on the same lines as that of one convalescent from duodenal ulceration, and is mankind happier when housekeeping and domestic life are reduced to the barest possible minimum?

The wild animal, human or other, tends to hunt for long hours or days, and when he has killed his food will eat to repletion and then indulge in a long sleep; whether or not this is a physiological ideal it must surely be remembered when the advisability of a diet of snacks is under consideration. One of the reasons why Amundsen returned from the South Pole when Scott and his companions did not was that the former with his men adopted the wise plan of marching each day until they were tired, and eating at the dictates of hunger, without guidance in either case by the clock. It is no detraction from the merits of the book of Haggard and Greenberg to say that such things must be thought of when drawing conclusions from their work.

THE Lancashire mental hospitals board is negotiating for the purchase of about 600 acres of land on the Lathom Hall estate, near Ormskirk, where it is proposed to erect two new mental hospitals at a cost of about £1,500,000.

THE INDIAN FIRE-WALK

A FIRE-WALK demonstration by Kuda Bax organised by Mr. Harry Price, the honorary secretary of the University of London Council for Psychical Investigation, took place last week in the grounds of a house at Carshalton through the courtesy of Mr. Alex L. Dribbel. Two trenches about 11 ft. long, 6 ft. wide, and 9 in. deep had been dug in which had been kindled a charcoal fire. Seven tons of oak logs, one ton of fire-wood, ten gallons of paraffin, and fifty newspapers were used in preparing the fire. On the top was spread half a ton of forest-burnt oak charcoal. The fire was ignited at 8 A.M. in the morning of Sept. 17th. The walk took place between 3 and 4 P.M. on the same day when intense heat was being given out from the fire. We are indebted to Prof. C. A. Pannett, F.R.C.S., for the following account of the proceedings:

Kuda Bax is the physically slight Indian type. He claims that his immunity from burning is due to an act of faith, to the influence of his mind over his bodily reactions. He is temperamental and took a dislike to one pit over which he could not be induced to walk, saying that he felt there was something wrong and unfavourable about it. The explanation of this attitude was perhaps revealed later; he had twice successfully walked over the one pit and had twice walked to the brink of it again to make a third attempt when his courage failed him. He said something had gone out from him and that the physicist who had taken the temperature of the glowing charcoal had desecrated the pit. He did not actually use that word, but said his was a religious act of faith and that it had been rendered impossible by the thrusting of the instrument (a thermocouple) into the burning embers. Up to this time the physicist had occupied himself with the pit from which Kuda Bax had already shown an aversion. When the thermocouple was placed in the fire it registered a temperature of 800° C., but when it merely made rapid contacts in imitation of footsteps it only registered, I believe, the temperature of rather warm water. On the other hand two English volunteers certainly blistered their feet in making attempts at the walk.

There appeared to be nothing abnormal about the soles of Kuda Bax's feet. The skin was soft and not at all callosed. It seemed to be very dry, much drier than the feet of the two Englishmen who made attempts to walk on the glowing embers. A skin thermometer showed the temperature of his feet to be 93·2° F. After this they were washed and dried. After an interval of about 20 minutes, during which Kuda Bax loitered about the lawn, he walked the length of the pit which took, I think, four steps. He walked lightly but not with undue haste. He did it twice. Almost immediately after the second attempt (10 seconds perhaps having elapsed) the temperature of the soles of his feet was again taken and found to be 93° F. On inspection no sign of burning of the skin could be made out unless it were that certain areas appeared a little whitened, resembling somewhat epidermis which has been scorched but not enough to cause blistering. The varying pigmentation and texture of the skin of the sole, however, made it difficult to be sure even of this. There was no sign of blistering nor any hyperæmia, nor did there seem to be any discomfort.

One of the Englishmen, Mr. Digby Moynagh, who made an attempt had tried to do the same thing ten days before. The soles of his feet had numerous healing blisters on them. He acquired some more at the second attempt. His skin was moister than the Indian's and this may have had some influence, because afterwards a small piece of charcoal was found stuck to the skin, and on its removal a blister was found underneath. It is possible that moisture made the charcoal adhere and perhaps prolonged the period of contact. The other Englishman, Mr. Maurice Cheepen, who tried the walk was also blistered.

Before Kuda Bax made his attempt, a piece of zinc oxide plaster, ¼ in. square, was stuck to the arch of the sole of his right foot. At the end of the demonstration this piece of plaster showed no signs of burning, except that the fluff from the cotton fabric at the cut edge exhibited a very slight amount of scorching. The surface of the ignited charcoal was so irregular that contact must have been made with all parts of the sole.

No other facts were observed.

BIOLOGY AND HUMAN TRENDS

IN an article with this title reprinted from the *Journal* of the Washington Academy of Sciences (June 15th, 1935) Prof. Raymond Pearl contends that man is "enjoying better health, and individually survives longer than ever before." Of the truth of the latter statement there is no doubt, but some may question the truth of the former.

Prof. Pearl writes enthusiastically of the achievements of medical science. "The last seventy-five years," he says, "have witnessed more progress in knowledge of disease and its effective treatment and prevention than was made in all the time that went before," and he anticipates that even greater triumphs are in store for us. In regard to unemployment, he refers to the fact that new inventions and increased transport facilities have enabled a portion only of the world's population to produce all the essential forms of wealth (and more) and to carry on all the business of the world, leaving a considerable number of unemployed, for whom no work can be found. Some of these are unemployable by reason of mental or physical unfitness. "These," he remarks, "are kept alive by the rest of society for no realistically demonstrable reason other than that they were once born." As to the fit unemployed the author believes that means will be found to reduce their number, notably by the adoption of contraception which "with some justice" has been regarded as "the most important biological discovery ever made." He does not accept the opinion, generally held, that the differential increase of fertility among the least desirable members of the community, brought about by contraceptive measures, is leading to serious deterioration of the race.

The author is a staunch upholder of eugenics; he reminds us that at every stage of man's history, even before the time of Plato, men have lamented the indifference displayed to eugenic ideals. And he foretells a distant future when the facilities for easy and speedy transport to all parts of the world will lead to an interbreeding and blending of different races. "In the far off end all mankind will presumably be a rather uniform lot; all looking, thinking, and acting pretty much the same way, like sheep"—a consummation not, one would think, devoutly to be wished.

ARGUMENT ABOUT STERILISATION

THREE small books on sterilisation [1] approach the subject from widely different points of view. Dr. Whitney is the director of the American Eugenics Society, and his book is written in a frankly propagandist spirit for the interested but ignorant layman. His style is conversational and, at times, racy; the measures he advocates closely resemble those which find favour in this country, except that he wishes to make voluntary sterilisation available for habitual criminals. The effect of the book is unfortunately marred by the footnotes of an editor who never allows the reader to overlook the occasions upon which he differs from the author, and the impression thus created of a divided opinion upon a controversial subject is disturbing. The footnotes, moreover, are on occasion of questionable accuracy (p. 96) and taste (p. 143). The appendix of characteristics inherited in human beings contains some doubtful generalisations such as that St. Vitus's dance is recessive to the normal and that wanderlust and sealust are inherited as dominant characteristics in males and recessive in females.

Dr. Helen Macmurchy writes for a Canadian public. Her book consists almost entirely of excerpts from Government reports, Acts of Parliament, religious pronouncements, and medical journals. If she has had personal experience of either sterilisation or birth control, the fact is well concealed in her book. The quotations selected are for the most part out of date and not from authoritative sources, and do not assist the reader to an understanding of the complicated issues that are raised.

The sub-title of the third book indicates that it is not written primarily for a medical public, but for those who have doubts about the compatibility with Christian ideals of the proposal to legalise voluntary sterilisation. The authors, one of whom is the possessor of a diploma in economics and political science, have discussed critically and impartially the sociological data which bear upon their subject. The message of the book, which should admirably fulfil its essential purpose, is eloquently expressed in its concluding paragraph. "'A corrupt tree cannot bring forth good fruit' and it requires a very mediæval casuistry to assume that it ever will. Furthermore, no appeal can be made to the teaching of Jesus to tolerate an evil, that out of it good may come. There is no merit in allowing suffering for its own sake, especially when it is borne by others than ourselves. The call comes down through the ages to our generation to save the many that are yet unborn from the lifelong misfortune which is otherwise certainly theirs. Is there anything in the Christian faith which bids us turn a deaf ear to such a call?"

HEALING RITUAL IN SERBIA

A CYNICAL student of medical progress might amuse himself and perhaps others by a discussion of the respective shares of rationalism, empiricism, and mysticism in the best practice of Western Europe and America. It is not a matter of any great moment, for the patient gets the best of what is available when he happens to be ill, and it is a natural instinct with man to go on finding out why he does what he does. But if anyone wants to appreciate what strange procedures may constitute medical and surgical practice, and at one time did constitute it in our own country, he will find a mine of information in a book by Mr. P. Kemp [1] about what goes on in Serbia and the parts about it. Among what seems to be a mass of nonsense there are no doubt useful procedures and, it may be, something that might well be extracted for more general use. But the narrative in general is of more anthropological than medical interest.

DRUGS AND DOSES

Craig's "Posological Tables" (Edinburgh: E. and S. Livingstone, 2*s.*) and Morton's "Principal Drugs and Their Uses" (London: Faber and Faber Ltd., 2*s.* 6*d.*) have been revised and brought up to date. Craig, which enters on its sixth edition, gives the imperial and metric doses of all official drugs and preparations and many important unofficial ones, together with notes on their action and uses and form of administration. The list is not quite complete. Under tannic acid no mention is made of the use of a solution in the treatment of burns; calamine is stated to be used as an ointment without any indication of its widespread use as a lotion; synonyms of British products—Neokharsivan, Novostab, and

[1] (*a*) The Case for Sterilisation. By Leon F. Whitney. With an introduction and notes by Norman Haire, Ch.M., M.B. London: Lane, The Bodley Head. 1935. Pp. 215. 8*s.* 6*d.* (*b*) Sterilisation? Birth Control? A book for family welfare and safety. By Helen Macmurchy, C.B.E., M.D. Toronto: The Macmillan Company of Canada Limited. Pp. 156. 7*s.* (*c*) Sterilisation: A Christian Approach. By the Rev. J. P. Hinton, B.A., and Josephine E. Calcutt, M.A. London: George and Unwin Ltd. 1935. Pp. 196. 5*s.*

[1] Healing Ritual: Studies in the Technique and Tradition of the Southern Slavs. By P. Kemp. (Published in conjunction with the School of Slavonic and East European Societies, University of London.) London: Faber and Faber Ltd. 1935. Pp. 335. 21*s.*

N.A.B.—might have been included with Neosalvarsan as synonyms for Neoarsphenamine; and the nature of Liq. Ergosterolis Irradiati might have been given. Sulphonal is said to be administered in solution although in fact its solubility in water is only 1 in 450. There are moreover several misprints in the table "Additions to B.P. 1932," but otherwise the little book is very complete. The tables of incompatibilities and poisons and a pharmacological classification of the principal medicines are useful and the whole book should prove a good companion to the student and busy practitioner.

The other book is written by a sister tutor and is intended for the use of nurses. All the more important drugs are mentioned and widely used proprietaries have been included. A little more care in proof reading would have avoided some mistakes in the botanical sources of several crude drugs, and many of the definitions could be simplified with advantage. Is it needful for the average nurse to know that barbitone is "obtained by the condensation of ethyl-di-ethyl malonate with urea"? Stovaine is misstated to be "a derivative of cocaine." Parts 1 and 2 of the poisons' schedule have been included, but confusion can only result from applying the term "dangerous drugs" to substances of a poisonous nature irrespective of the Dangerous Drugs Acts. But these things can be overcome in future editions, and the book may well satisfy "the nurse's healthy and not unnatural curiosity about drugs which they are constantly administering to patients."

ANIMATED CARTOONS FOR HEALTH PROPAGANDA

THE notion of harnessing such symbols of playful irresponsibility as the manikins of an animated cartoon to any serious purpose may not commend itself to those who tend to seek diversion in their antics. The popularity of such cartoons suggests, however, that hygienic or any other sort of instruction could be put across effectively by their agency, especially if the lessons to be taught are well defined, practical, and concrete. The entertaining ten-minute film shown at Grosvenor House, Park-lane, W., on Sept. 24th would have been more cogent as propaganda if the mistakes of the victims of the Bad Health army as well as the modern health weapons whereby their recovery was supposed to be promoted had been more clearly defined. But the object of the promoters of the film, to show that when there is anything that can usefully be said to the public on health matters the cartoon can be made an effective way of saying, was amply achieved. The film is called See How They Won. It was produced by Celebrity Productions, and presented in colour by Revelation Films Ltd., under the auspices of Messrs. Boots Ltd., who entertained some 60 guests at lunch before the show. We learn that 200 picture houses have already booked the cartoon for exhibition.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, Oct. 1st.
Orthopædics. 5.30 P.M. (Cases at 4.30 P.M.), Mr. C. Max Page: The Development of Orthopædic Surgery (Presidential Address).
WEDNESDAY.
History of Medicine. 5 P.M., Dr. E. W. Goodall: Epidemiology and Some Epidemiologists (Presidential Address).
THURSDAY.
Tropical Diseases and Parasitology. 8.15 P.M., Prof. H. Hörlein (Dusseldorf University): The Chemotherapy of Protozoal and Bacterial Disease (with special reference to *Acaprin*, a new compound in Piroplasmosis, and *Prontosil*, a new azo dyestuff in streptococcal infections).

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.
FRIDAY, Oct. 4th.—8.30 P.M. (West London Hospital), Dr. Bernard Myers: Clinical Reminiscences (Presidential Address).

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Sept. 30th, to SATURDAY, Oct. 5th.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Course in dermatology (afternoons and evenings).—GORDON HOSPITAL, Vauxhall Bridge-road, S.W. All-day course in Proctology.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W. Mon., Tues., Wed., and Fri., 5 P.M., course in X ray interpretation.—PARK HOSPITAL, Hither Green, S.E. Week-end course on fevers. Courses arranged by the Fellowship are open only to members.

KING'S COLLEGE HOSPITAL, Denmark-hill, S.E.
THURSDAY, Oct. 3rd.—9 P.M., Dr. J. L. Livingstone: Diagnosis of Early Tuberculosis.
SATURDAY.—11 A.M., Dr. Livingstone: Blood Pressure and its Therapeutics. 11.30 A.M., Dr. Clayton and Dr. Cooksey: Demonstration of Massage, Remedial Exercises, and Electrotherapeutics. 2 P.M., Dr. Firth: Simple Gastric Disorders and their Treatment. 2.30 P.M., Demonstration of Clinical Cases. 4 P.M., Dr. McCance: Tetany—Film Demonstration. 5 P.M., Mr. Buxton, Dr. R. Lee, and Mr. Palmer: The Causes and Treatment of Backache.
SUNDAY.—10.30 A.M., Dr. C. Newman: New Drugs and Therapeutic Remedies. 11.15 A.M., Mr. Gilliatt: On Induction of Labour. Noon, Mr. Edwards: Ulcers of the Mouth. (These lectures are open to all medical practitioners.)

CHARING CROSS HOSPITAL, W.C.
SATURDAY, Oct. 5th.—10 A.M., Dr. H. A. Dunlop: Pain as a Neurological Symptom and its Treatment. 11 A.M., Dr. J. E. M. Wigley: Eruptions on the Hands and Feet. Noon, Dr. C. K. J. Hamilton: Acute Abdomen in Children. 2 P.M., Dr. Gordon Holmes: Demonstration of Cases. 3 P.M., Mr. R. A. Fitzsimons: Cholecystitis. 4 P.M., Mr. M. L. Hine: Eyes in General Practice.
SUNDAY.—10 A.M., Mr. E. D. D. Davis: Laryngeal and Tracheal Obstructions. 11 A.M., Mr. C. Jennings Marshall: The Chronic Abdominal Invalid. Noon, Mr. Norman Lake: Hallux Valgus. 2 P.M., Dr. S. Cochrane Shanks: Radiological Investigation of the Stomach and Duodenum. 3 P.M., Mr. A. Cameron MacLeod: Lantern Demonstration. 4 P.M., Dr. N. C. Plummer: Jaundice. (Open only to former students of the hospital.)

MIDDLESEX HOSPITAL, W.
MONDAY, Sept. 30th.—10.15 A.M., Mr. F. J. Cleminson: Clinical Demonstration of Hearing Aids. 11.15 A.M., Prof. Samson Wright: Recent Applied Physiology. 12.15 P.M., Mr. W. Sampson Handley: The Early Diagnosis of Acute Appendicitis. 2 P.M., Dr. C. E. Lakin: Difficulties in Diagnosis. 3 P.M., Dr. H. K. Graham-Hodgson: New X Ray Diagnosis Department.
TUESDAY.—10.15 A.M., Mr. Philip Wiles: Manipulative Methods in Practice. 11.15 A.M., Mr. G. Gordon-Taylor: The Attitude of Surgery Towards Hæmatemesis. 12.15 P.M., Mr. E. Pearce Gould: My Mistakes in Minor Surgery. 2 P.M., Dr. Izod Bennett: Demonstration of Medical Cases. 3 P.M., Mr. Victor Bonney: Talk on Gynæcology and Obstetrics. (Open only to former students of the hospital.)

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Oct. 3rd.—2 P.M., Dr. A. Signy: Pathological Demonstration.
Out-patient clinics daily at 10 A.M., and ward visits (except on Wednesday) at 2 P.M.

LONDON SCHOOL OF DERMATOLOGY, 49, Leicester-square, W.C.
TUESDAY, Oct. 1st.—5 P.M., Dr. A. C. Roxburgh: Syphilis.
THURSDAY.—5 P.M., Dr. G. B. Dowling: Seborrhœa and Seborrhœic Dermatitis.

LLOYD ROBERTS LECTURE.
MONDAY, Sept. 30th.—5 P.M. (1, Wimpole-street, W.), Mr. Wilfred Trotter: General Ideas in Medicine.

PUBLIC DISPENSARY AND HOSPITAL, Leeds.
WEDNESDAY, Oct. 2nd.—4 P.M., Dr. H. G. Garland, Dr. S. J. Hartfall, and Mr. L. N. Pyrah: Thyrotoxicosis.

ROYAL INFIRMARY, Manchester.
TUESDAY, Oct. 1st.—4.15 P.M., Mr. F. G. Wrigley: The Change from the Acute Middle Ear to the Acute Mastoid.
FRIDAY.—4.15 P.M., Dr. P. B. Mumford: Some Examples of Common Skin Diseases, with Discussion as to Treatment.

HUDDERSFIELD ROYAL INFIRMARY.—The private patients' department of this hospital has been formally opened. It contains 13 single-bedded rooms, and three rooms each containing two beds; fees are five guineas a week in a single-bedded room and four guineas in a double-bedded one. The medical and surgical fees are in no case to exceed 15 guineas for one admission.